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ABSTRACT

This document, part one of a report on performance contracting, explores its basic issues and considerations and is addressed to educational decisionmakers. The evolution of performance contracting is traced and the concept as it is currently being applied in education is discussed. The second part will analyze the outcomes of some programs when 1970-71 results are available. The final report, a Performance Contracting Guide, will combine original concepts with conclusions drawn from program results to produce a general guide on how to plan, conduct, and evaluate performance contracting programs. The appendix provides decisionmakers with information on contracting experiences in other sectors such as the Department of Defense and the National Aeronautics and Space Agency. A related document is EA 003 603. (Author)

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May 1971

THE PERFORMANCE CONTRACTING CONCEPT IN EDUCATION

J. P. Stucker and G. R. Hall

A Report prepared for

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

EA 003 602

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PREFACE

This is the first of three Rand Reports on performance contracting in education. The study is sponsored by the Assistant Secretary for Planning and Evaluation of the United States Department of Health, Education and Welfare under Contract No. HEW-OS-70-156.

This Report consists of two parts. The present volume explores the basic issues and considerations in performance contracting. It is addressed to educational decisionmakers, particularly those guiding local school districts.

The second part is a technical addendum, *The Performance Contracting Concept, Appendix: A Critique of the Theory* (R-699/2). A survey of the state of the art, it summarizes a number of mathematical models that have been developed to analyze contractual incentives, and presents a critique of the theoretical underpinnings of performance contracting. The appendix will be of more interest to theoreticians and model-builders than to decisionmakers.

After tracing the evolution of performance contracting, the Report discusses the concept as it is currently being applied in education. This discussion is necessarily incomplete, since few programs have been completed at the time of publication and little can be said about outcomes. A later Rand Report will analyze the outcomes of some programs after 1970-71 results are available.

The final Report will be a Performance Contracting Guide. It will combine the concepts of the first Report with conclusions drawn from program results in the second to produce a general guide on how to plan, conduct, and evaluate performance contracting programs.

The focus of the entire project is on decisionmaking. Local school officials and school board members, in assessing the usefulness of performance contracting for their districts, must observe and evaluate programs in other districts in light of their own schools' requirements. State and Federal officials must inform themselves about this new and rapidly expanding movement in American education.

By analyzing the basic decisions involved in applying the performance contracting concept to educational services, this Report takes an initial step toward making informed judgments possible.

SUMMARY

Performance contracting is a new and increasingly popular technique in education. Many school districts now have performance contracts with private learning-system firms or groups of teachers. These contracts call for the education of designated groups of students, whose measured achievement determines the amount of the contract payments. The usual measure is the difference in the results of two forms of the same test, given at the beginning and the end of the program.

Performance contracting is only one of several arrangements school districts can use. There are two broad classes of contracts. *Fixed contracts* specify fixed payments for fixed outcomes; that is, the buyer contracts for very specific actions, and can refuse delivery and demand redress if the seller fails to perform them exactly as specified. *Performance contracts* allow for a range of outcomes and a corresponding scale of payments. These contracts are usually employed when the buyer has no tightly defined idea of the action he wants performed, or the seller is uncertain of his ability to deliver. Both parties then agree that payment will be contingent on the achieved level of performance.

Under either kind of contract, the buyer may further contract for either *resources* or *results*. A school district, for example, may contract for buses and drivers, or for the bussing of students; it may contract for teachers and books, or for student achievement. The distinction hinges on who exercises day-to-day authority over the endeavor and is therefore responsible for the outcome.

In order to contract for results, the product or service the contractor is to furnish must lend itself to clear definition. Performance contracting has an even more rigorous requirement: the contractor's achievement must be objectively measurable. At present, most educators agree on specification and measurement techniques for only a few subjects, notably reading and mathematics, to which most current projects are confined. Even for reading and mathematics, however, many educators are dissatisfied with present testing instruments. The future expansion of performance contracting is therefore very likely to depend largely on the development of more acceptable norm-referenced and criterion-referenced measures of achievement.

Judging the 1970-71 programs will entail further difficulties. While most performance contracting programs are remedial, generally use an individualized ap-

proach to learning, and focus on reading and mathematics, they are far from uniform. They are heterogeneous with respect to student populations, incentives, contractors' backgrounds and approaches, program organization, and objectives. Furthermore, all are experimental, and each school district has its particular objectives, socioeconomic setting, and constraints. Consequently, judgments of one program may not apply to others. For the same reasons, this study emphasizes that there is no universally preferable type of contract or arrangement a school district should adopt; the choice will depend on local circumstances.

In view of these considerations, it is all the more urgent that careful evaluation of experience should constitute a vital part of the current performance contracting movement. This evaluation should take into account much more than the academic achievement gains specified in the contract; it should take a broad total-program perspective. For one thing, a contract typically encompasses only a portion of the program. The cost and effectiveness of other aspects, such as school district investment, teacher training, and outside support (if used) should be analyzed; so should important impacts that transcend student achievement—for example, changing attitudes of and relationships among students, parents, teachers, unions, school officials, and the electorate at large.

No one is yet in any position to pass judgment on the efficacy of performance contracting in education. The extensive number and diversity of programs now under way, however, should provide enough evidence at the end of the school year to enable a plausible prognosis for the future of this technique.

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FIGURES

1. CPAF "output" criteria 62
2. ASPR Contractor Performance Evaluation Report..... 64

TABLES

1. Completed Performance Contracting Programs..... 26
2. Operational Programs, Fall 1970..... 27
3. Teacher Achievement Programs, Fall 1970 28
4. Office of Economic Opportunity Social Experiment Programs, Fall 1970 29
5. Source Selection of Learning System Contractors..... 37
6. Cost Structure for a Performance Contracting Program..... 39
7. Program Support Contracts 42
8. Classification of Federal Contract Types 55

CONTENTS

PREFACE iii

SUMMARY v

ACKNOWLEDGMENTS vii

FIGURES ix

TABLES ix

Section

I. INTRODUCTION 1
- Origins of Performance Contracting 1
- Outline of the Study 3

II. PERFORMANCE CONTRACTING 5
- Types of Contracts 5
- Program/Product Specification 6
- Selecting a Contracting Method 7
- Tradeoffs in Contract Selection 9
- Summary 12

III. CONTRACTING FOR STUDENT ACHIEVEMENT: GENERAL CONSIDERATIONS 13
- Educational Goals and Objectives 13
- Contract Specifications and Noncontractual Objectives 15
- Present Curricular Limitations on Contractors 16
- Relative Technologies and Management Skills 17
- Institutional Considerations 19

Other Considerations 22
Summary 23

IV. CONTRACTING FOR STUDENT ACHIEVEMENT: CURRENT PROGRAMS 25
Current Programs 25
Program Objectives and Specifications 29
Contract Objectives and Specifications 31
Problems with Testing 31
Learning System Contractors 34
Program Risks 37
Program Costs and Contract Prices 38
Program Support 40
Some Implications 43

V. SUMMARY AND CONCLUSIONS 45

Appendix
SOME CONTRACTING EXPERIENCES IN OTHER SECTORS 49
Project/Product Definition 49
Incentive Fees in Contracts 53

NOTES 67

I. INTRODUCTION

During the 1969-70 school year, two school districts entered into performance contracts with educational firms; in 1970-71 this number is probably at least one hundred. The exact number cannot be ascertained, since new programs are being started throughout the year and many have received little publicity. Because these pilot programs could lead to a rapid and widespread adoption of the strategy, it is important to examine the performance contracting concept and its current applications in education.

Precise definition of performance contracting is a complex matter, and will be taken up in Sec. II. For the time being, we shall use the rough working definition that a performance contract is a covenant between a local educational agency (LEA) and a learning-system contractor (LSC) in which the LSC's payment is related to some measure of the academic achievement of the students in his learning program.

ORIGINS OF PERFORMANCE CONTRACTING

The performance contracting movement is the foster child of discontent with our educational system coupled with the governmental struggle to improve procurement procedures.[1] The public is concerned over the failure of the schools to provide training—particularly in reading—that will convert students into effective and productive citizens. The statistics are numerous and depressing. To illustrate, one-fourth of all students in the nation have major reading deficiencies, and more than three million adults are illiterate.[2] This is a national problem, but it is especially severe for culturally and economically disadvantaged student populations.

Poor student achievement is nothing new; what is new is public awareness of its consequences and the realization that neither increasing the Gross National Product nor spending more money on education is an automatic cure. At the same time, the public is demanding from the schools far more than first-rate teaching of the three Rs. Burkhart ably describes the schools' latest transit from frying pan to fire:

> The schools, to their own astonishment, now are confronted with trying to save, through education, the poor, the physically and emotionally handicapped, and the culturally, socially and economically disenfranchised of the nation. Those in a position of responsibility know that we are doing less than a creditable job of facing these difficulties in our schools, because our teachers and schools are not geared for dealing with the realities of our national problems. However, these problems are the schools' problems . . .[3]

More important for performance contracting, the schools now get the blame when their students fail. In earlier days, learning was up to the student. If he failed to digest what the school offered, it was assumed that the fault lay in his laziness, lack of intelligence, or unwillingness to learn. Today the situation is reversed; many groups are demanding that schools somehow infuse all students with the skills necessary for the world of the 1970s. A landmark in this trend was the proclamation in 1969 by James E. Allen, then U.S. Commissioner of Education, of a "national right to read."[4] Every student, Allen said, should leave school with the skill and desire to read to the full limits of his capacity, and public policy and action at both Federal and local levels should be directed to this goal. School systems have responded by searching for new methods to show their commitment to increasing student attainments, particularly among minority and disadvantaged students. Federal money has been made available to support such efforts. This new school climate has led to a search for educational innovations, and perfomance contracting has been seized upon as a promising candidate.

Another impetus toward performance contracting has been exasperation with the slow pace of technological change in American public school education. Rapid evolution of institutions and procedures has become a way of life in America, but education is a notable exception. The classroom of today may or may not be architecturally different from the classroom of thirty years ago; the usual classroom organization, materials, and techniques, however, are remarkably similar.

Educational research and development (R&D), despite a paucity of funds, has produced many prototypes of new equipment, techniques, and procedures. Typically, an innovation is developed, tested, and demonstrated under "field test" conditions. Then a report is written and quietly relegated to library shelves while public education goes on unaffected.

Everyone involved with educational R&D, technology, or policy has been frustrated by this resistance to change—most of all, the suppliers of educational equipment, materials, and services. Many of them have entered the educational market since 1960, believing that their products and services would benefit students and yield a profit to the firms. Because a major market for new educational technology has not developed, however, many firms have been rethinking their marketing strategies, and have given much attention to a total-systems approach and guarantees to buyers. They, too, became ready for the performance contracting movement.

A third strand in the pattern is the educational accountability movement. Taxpayers are now notoriously loath to meet the requests of school officials for

resources; estimates of the failure rate for voter approval of school bonds and tax increases run as high as 75 percent. And a typical attitude of public officials was expressed by Minnesota Governor Harold LeVander when he complained that, "We've doubled the expenditures for education in Minnesota but we haven't doubled the quality."[5]

One response by many education leaders, including executives for the U.S. Office of Education, has been to try to develop programs to promote educational accountability.[6] The basic idea is that schools will be held responsible for educational outcomes—that is, what the students learn. Performance contracting has seemed to a number of authorities to be one way to promote this aim.[7] Indeed, the notions of performance contracting and accountability have been so linked in the last few years that it is important to emphasize that they are separate but related concepts.

The final trend in the performance contracting movement has affected all governmental activities: the drawing away from traditional procurement techniques and toward new and more system-oriented and output-oriented procedures. The new techniques, the developers hope, will lead to better analyses of the costs and benefits of governmental expenditures and provide contractors with more incentives for efficiency and innovation. This development has antecedents in such diverse sectors as water resource development and hospital insurance, and particularly in defense procurement. Consequently, in discussing performance contracting in education we shall have occasion to refer to experience in other areas. We shall particularly refer to experience in acquiring technologically advanced defense systems, which includes substantial experience with many of the techniques now involved in educational performance contracting.

In 1969 all these trends came together to produce the first performance contracts for educational services. Many people identify performance contracting with the features of the Texarkana project during 1969-70. This is a quite inappropriate identification, since many of the present programs bear little resemblance to the original Texarkana program. During 1970-71, school districts are applying the method in a variety of ways to achieve a variety of objectives.

To be more specific, a performance contracting progam may involve a large profit-oriented business firm; it may involve advanced educational technology; it may involve extrinsic motivators for students and teachers; it may involve an independent educational evaluator or auditor; and it may involve many other elements. On the other hand, it may involve none of these features. Performance contracting is not a program, but a method for organizing programs. This method should not be confused with the specific ways in which it has been applied.

OUTLINE OF THE STUDY

The object of this Report is to explain the basic performance contracting concept, to define and discuss the basic issues involved in the decision to undertake a

performance contracting program for the education of public school students, and to place these issues in perspective.

Section II discusses the definition and applicability of performance contracting for results. Four basic types of contracts are defined, with simple examples to demonstrate the uses, implications, and desirability of each type. Attention is on four basic considerations: product specification; risk; technologies and skills; and institutional and other local constraints. These considerations are then related to the selection of the desired type of contract for use in a particular situation.

Section III takes up contracting for the education of public school students. The basic considerations outlined in Sec. II are discussed in the context of the public schools and are related to the possibilities and attractiveness of performance contracting for student achievement.

The major points developed in Secs. II and III are illustrated in Sec. IV by a discussion of some of the currently (1970-71) operational performance contracting programs. Section V summarizes the Report.

Because the educational application of the performance contracting concept is a recent phenomenon, this Report's basic conceptual discussions of the concept derive partly from sources outside the educational community. Much of this information is described in detail in the Appendix. A separately published addendum, *The Performance Contracting Concept, Appendix: A Critique of the Theory* (R-699/2), summarizes the present state of the art of the theory of performance contracting.

14

II. PERFORMANCE CONTRACTING

Performance contracting is one of several contracting methods available to school districts in procuring goods and services. This section illustrates, usually by simple examples, the major contracting methods and the considerations involved in the use of each. Section III relates these elementals to contracting for the education of children.

TYPES OF CONTRACTS

A contract is a legal agreement between two parties in which one party promises to execute some specific act or acts in return for a consideration of value from the other. In most cases, if these acts are not performed exactly as specified, the buyer can refuse delivery and ask for redress. We shall refer to contracts of this type as fixed-outcome/fixed-payment contracts, or simply as *fixed contracts.*

Other contracts allow for a range of possible outcomes and a scale of payments. The outcome actually achieved determines the specific payment to be made. These contracts are usually employed when the buyer has no tightly defined idea of the action he wants performed, or the seller is uncertain of his ability to deliver. Contracts in which the payment is contractually contingent on the level of performance —that is, in which a range of outcomes are acceptable and a variable payment schedule is specified—are referred to as *performance contracts.*

A legal entity such as a school district may contract for *resources* or it may contract for *results.* That is, a school may contract for carpenters and bricks, or for a new building; for buses and drivers, or for the bussing of students; for teachers and books, or for student achievement. The crucial distinction is whether the school buys the resources and then directs their use to achieve some desired results, or whether it contracts directly for the results. In short, the crux is the allocation of authority over day-to-day operations.

Under a contract for resources, the school procures the resources and then issues specific directions on how the work is to be accomplished, the resource combinations to be used, work rules, and the like. These directions may be constrained by

contract provisions; for example, it may be stated that all work rules must comply with general union regulations. The school retains basic entrepreneurial and managerial control, however.

Under a contract for results, this control is typically bestowed on the contractor, who is authorized to decide on work procedures and resource combinations. Again, the contract may establish general rules, such as that all employees must belong to a union or that the contractor must take affirmative action against racial discrimination. Obviously, the school's control is much less under a contract for results.

Both fixed and performance contracts may be drawn up for either resources or results. A *performance contract for resources* usually makes payment contingent on the quality of the resources delivered. For example, a contract for fuel oil may provide for differential payments depending upon the grade of fuel delivered; and teacher contracts sometimes award bonuses or pay raises to teachers who assume extra duties or who take special courses.Under a *performance contract for results,* payment is usually contingent on the quantity or quality of the results. For example, when a school district contracts with an educational firm to teach children to read, the payment scale is usually indexed on the children's gain in reading ability.

Other "mixed" types of contracts are sometimes encountered. One form in particular warrants discussion: occasionally, a contract calls for the provision of resources but bases the fee on some index of results. For example, a school district may purchase reading textbooks under the provision that a portion of the payment will be based on the reading achievement of students who use the texts. Such a contract may be called a *mixed-performance contract.* The seller is required to stand behind the results achieved with his product, but since he has little or no control over this achievement, such contracts are rather rare.

PROGRAM/PRODUCT SPECIFICATION

Selecting the proper type of contract can be very difficult. In some circumstances, certain types of contracts will simply not be feasible; in others, many or all types will be possible, and the problem is to determine the most appropriate one for the situation. The two major restrictions on contract selection deal with the specification of the product.

The feasibility requirement in contracting for results is that the product must lend itself to clear definition. Whether he is contemplating a fixed or a performance contract, the buyer must be able to specify the desired results in simple, straightforward terms to a prospective seller. These terms must also be meaningful to a knowledgeable third party so that, if a dispute arises, he can determine whether the contract terms have been fulfilled or not. In purchasing books or equipment or even buildings, the school is usually able to describe exactly the product it is after. Such procurements as the purchase of administrative services are not so easy. Typically, a school administrator is hired to "administrate." Most school boards believe they

can judge the qualifications of a prospective administrator and list the functions he is to perform. It is usually extremely difficult if not impossible, however, for them to agree on an explicit, objective method for measuring his performance. Consequently, contracts between school districts and administrators are usually simple employment contracts; that is, they are fixed contracts for services or resources. Administrators can still be "held accountable," of course, with their efforts and results evaluated in subjective terms. These evaluations are necessary considerations in contract renewal proceedings but they are seldom, if ever, sufficiently specific to be useful in assessing a contract for results.

Performance contracting entails a more specific and stringent feasibility requirement: over and above clear definition, the contractor's actions—his performance—must be objectively measurable. This applies whether the contract is for resources or results. The quantity and quality of resources are almost always readily measurable; measuring results is often difficult. Many products that can be specified cannot be scaled. For example, a school can contract for the provision of food services either by specifying menus or by specifying general requirements of nutritional value, diversity, attractiveness, tastiness, and scheduling. But neither of these product descriptions, with the possible exception of nutritional value, is amenable to scaling and measurement. Other tasks performed in the school, however, such as student bussing and the teaching of typing and shorthand, yield products that have long been commonly expressed in readily measurable units.

In sum, school districts may choose among four major types of contracts to procure goods and services: fixed or performance contracts for resources, and fixed or performance contracts for results. A fixed contract for results is feasible only if the LEA can explicitly and objectively specify the results it desires. A performance contract for results requires, in addition, that the LEA be able to scale the results it is after, so that "more" and "less" become meaningful and measurable concepts.

SELECTING A CONTRACTING METHOD

The school district's choice of contracting method will depend on four factors: risk; relative advantages of the LEA and the potential contractor with respect to technology and management skills; institutional constraints; and any other intangible considerations that may apply. How these factors interact to determine the type of contract can best be explained by illustration. Student bussing is a good example. Typically, the task is to transport some number of students from some number of pickup locations to and from school, arriving at and departing from the school at certain times, for a certain number of school days. The major inputs are buses, drivers, time, service and maintenance, and management, and the output is the on-time pickup and delivery of the students. The inputs are easily measured, and simple measures of the output can be constructed, such as the number of days delivery is accomplished, the percentage of the students delivered each day, and the lateness of delivery (say, in minutes). The problem facing the school officials is how

to contract for this operation. As we have described it, the school is able to consider either a fixed or a performance contract for either resources or results.

Risk

Risk is present in the bussing operation in several forms. Machinery is subject to random failures that can cause operations to be delayed or even cancelled. So are drivers; they can be tardy or sick and they can commit errors of judgment. In some areas of the country, the weather is an important and extremely variable factor. In addition to these factors, all relating to the success of the bussing operation, the form or level of the operation is itself usually uncertain. The school will always desire to have "all" of its eligible students transported, but the number of students and their locations may change over the course of the year.

Both parties to the contract will have at least an informal budget; that is, each will have some funds directly available for bussing operations, and other monies that can more or less easily be reallocated to bussing activities if the need arises. Each will also have some more or less attractive alternative uses for the budgeted bussing funds. Furthermore, each party will have some preference, determined by the availability and alternative uses of funds as well as by many other factors, for stability in its finances and operations. Some groups desire to completely specify sources and usages of funds at the beginning of the budget period, while othes prefer some degree of flexibility.

Relative Technologies and Management Skills

The technical and managerial skills available to the school and the prospective contractors may be identical or they may differ greatly. If they differ, it is usually because of specialization or economies of scale. Consider two cases. In the first case, the prospective contractor is a loosely organized (probably part-time) firm set up to handle this specific bussing operation. There may be no reason to believe it would be superior to the school in technical skill or management expertise, or that it could acquire any better equipment than the school could. In many situations of this kind, the option open to the school is between contracting with the firm or hiring most or all of the same personnel to operate the school's own bussing program.

At the other extreme, the school may have the option of contracting with a large, well-established company that specializes in bussing services and has many employees who are well versed in bussing procurement, maintenance, operation, and management. Furthermore, this company probably has many bussing contracts, so that its personnel can be specialists and its equipment can be specialized, while still being scheduled and utilized efficiently. Such a firm is probably much better at bussing than the school could possibly be; that is, it can probably provide a specified bussing service cheaper than the school can or, for the same amount of money, can provide better service.

Institutional Considerations

Institutional factors may also restrain (or aid) the operations of either party. All organizations operate in an institutional, legal, and political environment that may profoundly affect their operating procedures and capabilities. Favorable personnel policies may aid the school in recruiting bus drivers, while a bussing firm may face strict union rules. In some cases, state laws may flatly forbid a school to contract for bussing services. In other states, local political sentiment about the "free enterprise system" may prevent the school from running its own buses.

Other Considerations

Finally, contract decisions may be influenced by wholly rational but nonquantifiable considerations. Some organizations deem it desirable to develop an "in-house capability," and may be willing to put up with short-run disadvantages or inefficiencies associated with contracts for resources in order to increase their own long-term potential. In other situations the same organizations may believe they can enhance their long-term potential more by contracting for results and then closely observing the contractor's methods and technologies. Sometimes a school district may decide that, even though it might be somewhat less expensive to contract for resources, it would be advantageous to let a contract for results and not be involved in managing the operation. This can be a very rational decision if such involvement would interfere in any way with the district's other duties.

TRADEOFFS IN CONTRACT SELECTION

Contract negotiations resolve three major issues:

1. Decisionmaking authority. When a school contracts for resources, the school retains authority over the operation; when it contracts for results, this authority resides in the contractor.
2. The decisionmaking time pattern. In a fixed contract for either resources or results, all decisions relevant to the contract are made during negotiation. In a performance contract, some decisions can be deferred.
3. Pricing, or the determination of the relationship between the act(s) the contractor is to perform and the payment he is to receive.

In practice, these issues are usually resolved in two steps. The selection of a contract type resolves the first two, and then the negotiation of specific terms resolves the third. These issues should never be resolved independently. Further development of the bussing example will illustrate that these issues are highly interdependent and must be jointly resolved by considerations involving the aforementioned factors of risk, technologies and skills, institutional constraints, and

other benefits and costs. We begin with a very unrealistic case in which no risk whatever is present in the operation.

In a world of complete certainty, contractual issues could be resolved solely on the basis of financial preferences and technical and institutional advantages. There would be no reason to defer any decisions, and the school's desire for financial stability would undoubtedly result in the selection of a fixed contract with both product and cost firmly specified at the beginning of the school year. The school's choice between contracting for resources or results would depend simply on the technological and institutional advantages under the two approaches and the resulting costs of the bussing operation. Simple situations of this type are exceedingly rare, however. Usually, at least a moderate amount of risk is inherent in any operation, and its presence multiplies the tradeoffs that must be considered.

The presence of risk, whether it is in the form of uncertainty regarding the number of students to be transported, the number and location of the pickup points, the technology, or whatever else, significantly degrades the desirability of a fixed contract.

Fixed Contracts for Resources

A school that negotiates fixed contracts for bussing resources must specify (at the beginning of the term) the types and quantities of resources it desires. It then knows its costs for the year. The risks in the bussing operation, however, prevent the school from knowing what the effectiveness of these resources will be. For example, bad weather or breakdowns can delay or prevent the delivery of students, or an increase in the number of students to be transported can seriously degrade the transportation of all students. On the other hand, if the busses turn out to be extremely reliable or if a large number of students transfer out of the district, the school may find itself with an excess of transportation resources.

Hence, if the school clings to fixed contracts for resources, it faces a tradeoff between the types and levels of resources to purchase, and consequently their cost, and the expected level of service they will provide. If the school places a high value on having all of the students arrive at school on time every day, it will have to contract for a liberal amount of high-quality resources. If its budget is tight, on the other hand, it will have to settle for a lesser amount of resources and less reliability. The school's perception of the amount of risk present will determine its concern with this tradeoff, and the school's relative valuation of funds and operational stability will determine the final selection. If it views the tradeoff as highly significant, however, the school may desire not to make a final, firm selection at the beginning of the term. One way to defer this decision is to use performance contracts for resources.

Performance Contracts for Resources

In this context, performance contracts for resources can most easily be thought of as contracts for buses and drivers that allow the school to select the level

of these resources that it desires on a monthly, weekly, or even a daily basis, with payments varying accordingly. With contracts of this type, the school is able to alter the level of bussing service and its cost as time passes. Whenever an unexpected event occurs, the school is able, if it so wishes, to change its level or intensity of operations. This flexibility comes at a price, however. The school will typically be forced to pay more for any given level of resources when it has the option of choosing and changing this level as time passes than it would have to pay if the level were fixed for the entire year. The school is shifting the burden of uncertainty onto the contractor, who will charge something for accepting the risk.

Stated conversely, the contractor would be willing to pay a premium (accept a lower price) for knowing at the beginning of the term what will be required of him throughout the term and being able to plan accordingly.

In considering a shift from fixed to performance contracts for resources, then, the school must evaluate the benefits it would receive from being able to alter the level and intensity of its bussing operations over time against the additional costs it would incur.

Fixed Contracts for Results

Contracting for results is another way to cope with uncertainty. As mentioned previously, if the product can be specified, the school can consider contracting for results, and we suggested several output dimensions that could be specified in a student bussing operation. If the school is willing to specify acceptable levels of these output dimensions, it can negotiate with potential contractors.

The school determines the amount of risk it transfers to the contractor by specifying the output. If the contract states that all students will be delivered to school by 8 a.m., the school has essentially transferred all of the risk and the contractor's bid price will reflect this fact. If, on the other hand, tardiness will be allowed up to twelve days a year without affecting the contract, the contractor's risk is significantly less and his price will be lower. The school gets a lower price by relaxing its requirements, but it assumes more risk of the students not being delivered. Once again, the fundamental fact is clear: the school can transfer risk only if it is willing to pay a risk "premium." As with contracting for resources, it must evaluate the basic tradeoff between level of service and cost.

Performance Contracts for Results

In contracting for resources, it is often possible to reduce risk by deferring certain decisions—that is, by shifting from fixed to performance contracts. An analogous situation exists in contracting for results. In a fixed contract for results, the product specifications and the payment to be made (which will reflect the contractor's risk at that particular level) are determined at the time of contract negotiations.

If the school is willing to accept a variety of levels of service with a correspond-

ing scale of payments (a performance contract for results), it can expect the contractor to be willing to accept a lower price for any given level of service than he would under a fixed contract—he will not be in default if he fails to achieve a particular level of service. The school "pays" for the lower prices by giving up its ability to specify the level of service that will be delivered. Performance contracting for results has advantages and disadvantages for both parties, then, as do all of the other types of contracts.

SUMMARY

These examples have illustrated the various types of contracts, the feasibility of using each type, and how various considerations interact to determine the most appropriate type for a particular situation.

Four basic types of contracts can be used to procure goods and services: fixed and performance contracts for resources, and fixed and performance contracts for results. The basic distinction between contracting for resources and contracting for results is whether the school or the contractor will have authority over the day-to-day operation of the project. The basic distinction between a fixed contract and a performance contract is whether a single outcome and payment are specified, or whether a range of acceptable outcomes and corresponding payments are allowed for.

There are two fundamental restrictions on a school's ability to contract for results. A fixed contract for results requires that the desired results can be defined explicitly and objectively. A performance contract for results has the additional requirement that the school must be able to measure objectively the results it is after; that is, "more" and "less" must be meaningful and measurable concepts.

Choice among the four types of contracts depends on the nature of the operation. The basic considerations are risk, relative technologies and management skills between school and contractor, institutional considerations, and any other intangible factors that may be present. Two generalizations concerning contract preference are possible. First, the greater the technological and managerial advantage of the prospective contractor over the school, the greater the advantage of a contract for results over a contract for resources. This advantage may be offset, however, by institutional or sociopolitical considerations. Second, the greater the risk in a project, the greater the advantage of a performance contract over a fixed contract.

These generalizations are directly applicable to contracting for student achievement. A performance contract for results is most appropriate when (1) the desired results can be quantitatively measured and scaled, (2) the school believes the contractor has some technological, managerial or institutional advantage in achieving the desired results, and (3) the risk inherent in the operation is too great to allow the use of a fixed contract for results.

III. CONTRACTING FOR STUDENT ACHIEVEMENT: GENERAL CONSIDERATIONS

A school district interested in setting up a performance contracting program should consider how the factors discussed in Sec. II apply to its own local circumstances. It will also be informative to examine the arrangements made by a variety of American school districts in pursuit of a diversity of objectives, which is the subject of Sec. IV. First, however, we should be aware of the unity underlying this diversity; this section reviews some of the major considerations that apply to nearly all programs.

EDUCATIONAL GOALS AND OBJECTIVES

It is not easy to specify the objectives of an educational program, whether conducted by the school or by a contractor. One of the first problems is to distinguish clearly between the broad societal *goals* to which the school endeavors to contribute, and the narrower *objectives* of an educational program or even a single class within a school.

What appears at first glance to be a hairsplitting semantic distinction actually touches on a key point in regard to performance contracting. A goal is a broad statement of direction and is not concerned with a particular achievement within a specified time period. An objective, in a contract, is a desired accomplishment that can be attained within a given time and under specifiable conditions. The attainment of the objective should advance the system toward a corresponding goal.

Perhaps there was a time when schools could afford a relaxed attitude toward this matter, nodding in agreement with a set of lofty but abstractly stated goals while concentrating on the sole task of teaching reading, writing, and arithmetic. If so simple a time ever existed, it has vanished. The twentieth century has generated a tremendous increase in the depth and breadth of the responsibilities assigned to American public education. Even the goals, while still lofty and broadly stated, have altered to reveal a more pointed concern with some of the special problems that afflict our urbanized and more populous society. It is interesting to compare two sets

of goals enunciated forty-six years apart. In 1918, the Commission for the Reorganization of Secondary Education set forth "Seven Cardinal Principles" of education:

Health;
Command of fundamental processes;
Worthy home membership;
Vocation;
Citizenship;
Worthy use of leisure; and
Ethical character.

In 1964, the American Association of School Administrators stated the following "Imperatives of Education":

To make urban life rewarding and satisfying;
To prepare people for the world of work;
To discover and nurture creative talent;
To strengthen the moral fabric of society;
To deal constructively with psychological tensions;
To keep democracy working;
To make intelligent use of natural resources;
To make the best use of leisure time; and
To work with other people of the world for human betterment.

While these goals are laudable and inspiring, it is difficult to translate them into workable objectives, and in the meantime the public clamor over education continues to grow. The electorate may vote down school bonds at the polls, but it shows a lively interest in measures of school performance. It avidly reads the latest national reading-test scores and does not hesitate to demand better performance from local schools. The current trend, therefore, is to attempt to devise implementable objectives. To illustrate, the California Advisory Commission on School District Budgeting and Accounting has suggested some objectives for a sixth-grade reading class:

1. Upon completion of the term, a sixth-grade pupil will be able to read and pronounce with 80 percent accuracy a district-compiled list of sixth-grade words selected from the basic Stanford Test—Reading.
2. Ninety-five percent of all students completing the sixth grade will be able to read with 80 percent comprehension a selected passage which has a reading difficulty level of an average newspaper article as measured by a district-wide test.
3. Eighty-five percent of all students completing the sixth grade will write an essay of approximately 300 words on a selected topic that meets the following criteria as evaluated by the teachers:

a. Not more than four errors in each of the following categories: word usage, punctuation, capitalization and spelling.
b. Essay contains relevant material.
c. Paragraphs structured properly.
d. Essay structured properly.

4. Ninety percent of all students completing the sixth grade will prepare and deliver a three-minute speech which contains proper word usage, pronunciation and articulation, fluency, sentence structure, quality of tone and expression, as evaluated by the teacher.[1]

These statements are lucid enough, but they still constitute a mixed bag of objective and subjective judgments. The yardsticks they incorporate would have to be much more precise to serve for a performance contract.

CONTRACT SPECIFICATIONS AND NONCONTRACTUAL OBJECTIVES

An LEA may sometimes have program objectives that are not spelled out in the contract. For example, it may wish to promote racial integration by providing a remedial reading program. Another LEA may wish to improve its general curriculum by experimenting with new teaching techniques. Both programs could nonetheless have identical contract specifications. In evaluating the usefulness of the program, then, the LEA should not judge solely by the contractor's measured success in improving reading skill, let us say, but should take into account any progress toward collateral objectives.

Put differently, it is important to distinguish between the overall educational program and that part contracted out to an LSC. The distinction is especially important because of the increasing use of program planning in education.

In an educational context, program planning entails viewing a school or district as a system made up of various components, and weighing the relative contributions of each component to the attainment of system objectives. For example, instructional materials, administrative and managerial support, teachers, in-service training, and various teaching and learning strategies contribute variously to the achievement of custodial care, cognitive development, affective development, and the like.[2]

A total program approach in planning performance contract programs is highly desirable. It is important that an LEA considering a performance contract give considerable thought to its educational objectives, resources, and alternative strategies. This approach does not imply that the entire program should be turned over to the contractor, however. How much of the program authority should appropriately be placed in the hands of a contractor is a difficult but separate issue.

PRESENT CURRICULAR LIMITATIONS ON CONTRACTORS

At this early stage of the performance contracting movement, it is usually unwise or infeasible for either party to consider assigning responsibility to a contractor for broad areas of subject matter. Performance contracting requires that the contractor's achievement be objectively measurable, and at present most educators are in reasonable agreement on measurement techniques for only a few subjects, notably reading and mathematics—and even for these, many educators are dissatisfied with present testing instruments. This is clearly an area in which research is urgently needed; the future expansion of performance contracting may well depend on the development of such instruments.

Even now, however, there are exceptions. A few contractors are teaching subjects other than reading and mathematics, and novel bases for rewarding contractors have been devised that sidestep the direct measurement of academic achievement. In Gary, Indiana, for example, Behavioral Research Laboratories is responsible for an entire primary school curriculum—but, interestingly enough, will be paid according to achievement in reading and mathematics.

Typing, shorthand, and most forms of vocational education also look like obvious candidates for contracting, since they usually possess well-established standards of achievement. But most schools believe they are handling these subjects well enough already, and that outside contractors have a technological advantage only in certain very specialized courses. Consequently, we may expect the spread of performance contracting into vocational courses to be limited and specialized.

Contractors have made a start in the vocational field, however. Vocational education is currently being taught under a performance contract in Dallas, Texas. There is also a very interesting example of a comprehensive performance contracting program in vocational education from outside the public school sector. The Thiokol Chemical Corporation has a Job Corps contract covering the entire operation of the Freeport Center in Clearfield, Utah. Thiokol's program combines training in seven vocational subjects, including agriculture, auto mechanics, medical services, and plastics, with a limited amount of conventional academic study. Successful students receive high school degrees or certificates verifying that they have passed the General Education Development Equivalency Test (GED). Thiokol's fees are related to four measures of achievement. First, Thiokol receives a specified amount for each student who receives a high school degree or GED certificate. It receives another fee for each Corpsman placed on a job, in a school, or in the military service (verifying this type of achievement is somewhat complex). During training, Thiokol also receives a fee for each Corpsman for each month in residence, between a minimum of three months and a maximum of nine. The fourth type of payment hinges on the completion of particular courses of study and clusters of courses. (This program is described in more detail in the Appendix.)

RELATIVE TECHNOLOGIES AND MANAGEMENT SKILLS

As discussed in Sec. II, a major factor in deciding whether to contract for resources or for results is a comparison of the two parties' technologies and managerial skills. It has been argued that outside contractors have several advantages over the typical public school district, notably in research and development, program implementation, and special motivations.

Research and Development

Some contractors believe they have special classroom skills, particularly in remedial work. Many other contractors, perhaps most, do not claim any special advantages as teachers or directors of teachers. As they see it, their advantage lies in educational research and development, and their classroom activities are simply a technique for marketing the products of their development activities.

Private firms may well have an R&D advantage over LEAs. The corporate firm is usually more flexible, able to adapt more rapidly and easily to changes in the state of the art. LEAs have to be more cautious; while a private firm can capitalize its R&D expenses and spread them over sales to a number of school districts, an LEA conducts R&D at its own expense and the local taxpayers alone bear the burden.

If this advantage is real, one may ask why no large and profitable educational R&D activity has developed in the private sector. The usual answer is that the structure of the public school sector makes it very difficult to transplant technology, and that new procedures are required if the potentials for technological change in education are to be realized. Let us examine these structural conditions in more detail.

The public school sector consists of teachers and administrators, most of the latter being former teachers who rose to administrator status through their teaching experience and special courses of study. Seldom does an administrator enter "laterally" at, say, the superintendent or assistant superintendent level by way of some related career, such as educational research.

Teacher training is highly specialized, with emphasis on the "practical"; it tends not to involve the student teacher in work on research frontiers. The apprenticeship experience of physicians and teachers poses an interesting contrast. A doctor is likely to intern in a teaching hospital or medical school complex, where he is exposed to the latest medical research and techniques of treatment. The student teacher is likely to do his practice teaching in an average classroom, not an experimental school, and in his apprenticeship is unlikely to be exposed to radical innovations. By and large, in-service training in medicine and other professions seems to do a better job of keeping the profession aware of new advances.

The teachers of the physicians are likely to be involved in research, much of which has been directly related to clinical practice. In contrast, educational research too often seems to be of interest more to the psychologist than to the classroom

teacher or school administrator; but few school districts have the resources to mount an R&D effort to overcome the lack of relevant R&D from organizations outside the school sector.

In short, one of the structural problems in education is the gulf between the operating sector—the schools—and the activities and results of the educational research sector. Direct contracts between LEAs and R&D organizations appear to some people to be an effective means of bridging this gulf. The new materials and techniques are directly available, after all; it appears to be simply a matter of putting them to work in the classroom—that is, of program implementation.

Here again, educational R&D organizations may have an advantage over the school.

Program Implementation

Each R&D organization naturally points with pride to its innovative techniques, materials, and equipment, which really would be novel in most typical classrooms. American educators have long been familiar with the components of most "advanced" programs, however. Contingency management, self-pacing materials, tape recorders, audiovisual machines, diagnostic tests, teacher aids, extrinsic motivators—all have been around the educational community for some time. R&D organizations may have a technological advantage in a more complex sense: their ability to put together innovative *systems*, as opposed to loose collections of components.

Many advanced programs attempt to change, simultaneously, a number of dimensions of the learning system. Innovations in materials, environment, and classroom organization may be tried out in order to reinforce the influences of various changes. An outside organization may find it easier to design a new program "from the ground up" than could someone already in the system. The outsider is not committed to present ways of doing things; and suspect though outsiders often are, it is a common human foible that people within a system may accept suggestions from an outsider that they would resent if they came from a colleague. There are advantages to being an "outside expert" who is "called in."

A perhaps more important advantage of the outside firm is the fact that it has both the time and trained people to plan for system change and perform effective troubleshooting when difficulties arise. A program that embodies many innovations demands a great deal of advance planning. Later on, changes that require further planning time are likely to be needed once the program is started, achievement results begin to come in, and logistic and management problems crop up. An educational firm with programs in a number of cities may be able to afford planning and troubleshooting talent that would be denied to the local school.

Motivation

Another advantage often attributed to contractors is the profit motive, pre-

sumably a solid reason for being concerned about whether students are actually learning. Some observers, on the other hand, view it as a strong disadvantage, on the grounds that contractors will be tempted to drive their students too hard and exploit them for the monetary return.

In analyzing incentives, one must distinguish among those operating at the firm level, at the teacher level, and at the student level. As will be discussed in Sec. IV, some programs, though certainly not all, incorporate extrinsic motivators for students. In a few programs teachers share in the profits. However, it is important to keep in mind that in most performance contracting programs, teacher and student incentives do not differ from those in conventional programs.

The profit motive is undoubtedly important, but should not be overemphasized. Contractors have other interests that transcend immediate monetary gains and may occasionally transcend the performance contract itself. It would be self-defeating for them to attempt to squeeze the last drop from any single program. Most contractors have a greater interest in acquiring a reputation for success than in earning maximum fees. Most programs are of rather short duration and the contractors, whether they are educational firms or specially organized groups of teachers, have a vital interest in what happens after these programs are completed. Some firms want to engage in more performance contracting programs and must accordingly perform well under their present contracts. Other firms are mainly interested in future sales of equipment and materials, and must therefore prove the effectiveness of their items. And the teachers in contracting programs, like teachers in general, are dedicated people on the whole, as interested in doing a good professional job and in their future employment and remuneration as they are in current rewards.

In short, many incentives are at work, both monetary and nonmonetary, both immediate and long-term; taken together, they may well constitute the major advantage of contracting for results.

INSTITUTIONAL CONSIDERATIONS

Most institutional considerations are local phenomena, but two exceptions have received much attention: state laws concerning school operations, and the attitudes of local, state, and national teacher organizations.

Legal Considerations

There are undocumented reports from several states that legal experts have issued interpretations to the effect that it is illegal for a public school district to contract with a private firm for the education of the school's students. Since these interpretations have not been published and circulated, it is unclear on what points of the contractual arrangements the legal opinions bear. At any rate, they have imposed no serious obstacles thus far; in most states from which adverse opinions

have been reported, there is now at least one operational performance contract involving a private firm.

One major legal issue appears to be the responsibility of the LEA with respect to the education of the children assigned to the LSC's program. There is great concern that the legally responsible authorities will surrender educational control to private firms. The American Federation of Teachers, for example, leads off its list of seven charges against performance contracting with the contention that it "... will take the determination of educational policy out of the hands of the public and place it in the hands of private industrial entrepreneurs." [3] Any such transfer would be not only dangerous but probably illegal under most educational codes.

Clearly, like any other public agency responsible to the citizenry, an LEA must have control of all its programs.[4] It can maintain it in several ways. It can hire its own staff and subject them to day-to-day direction of officials in the educational hierarchy; or it can establish product or output achievement specifications, contract for results, and ensure that the contract provisions are met.

In both cases, the public interest is protected if the contract is well written and the supervision function is discharged properly. In both cases the public interest is ill served if supervision is inadequate. The point is that there is nothing *inherent* in contracting for results that decreases public control.[5]

In two ways, however, student achievement contracts might lead to an improper transfer of decisionmaking and control authority from public agencies to private firms. One would be failure to specify output objectives or monitor performance. If an LEA merely called in a contractor and gave him free rein to specify the objectives and how he intended to achieve them, the LEA would be abdicating its responsibilities.

The other danger is less blatant and more complex. An important element in the theory of performance contracting is that the educational authorities will set objectives and establish incentives for contractors. Contractors will determine the optimal methods to respond to the incentives and maximize the attainment of the objectives. For this model to work, the contractor must have flexibility in choosing the methods he wishes to use. On the other hand, the policymakers may be far from indifferent with respect to methods. We can all think of some methods of instruction that might produce cognitive results but would have undesirable effects on students (the image of Charles Dickens's Mr. Gradgrind springs to mind). Methods that the school district does not want used should be clearly understood as prohibited. Of course, unless the set of approved methods is large enough to provide the contractor with a reasonable range of feasible choices, there is little point in contracting for results.

In general, it would appear that the intent of legal codes will be met if the LEA establishes firm and clear supervisory authority over the LSC. In programs where the LSC is operating within an otherwise conventional school, the principal and whatever other supervising authority is established would appear to provide this essential function. In Gary, Indiana, where an entire school is under the direction of Behavioral Research Laboratories, a school-board-employed and long-time princi-

pal is nonetheless located in the school and provides a continuing presence as the representative of public authority.

We may conclude that legal requirements that publicly constituted bodies cannot contract away their responsibilities dictate careful consideration of how performance contracting programs are organized, but probably will pose no major blocks to the application of the concept in education.

Several other legal requirements may affect performance contracting. For example, many states have laws concerning textbooks and other materials, and about how contracts must be let. In many cases, waivers of these requirements have been obtained on the grounds that performance contracting programs are experiments. If performance contracting becomes a standard practice, it will be because it has proven its usefulness; success would be its own argument for legislative or administrative exemption from or changes in legal codes.

Union Considerations

In school districts with a recognized teachers' organization or union, the master contract may impose constraints on performance contracting. In contracts for student achievement, the learning system personnel may be on the payroll of the LEA and may be members of a teachers' union if there is one in the district. If teachers are brought in from outside the area, presumably they could be recruited by a union. Although it seems there should be no inherent difficulty in harmonizing performance contracting and the union-employer relationship, the fact is that union questions are fast emerging as one of the major issues.

In general, during the 1970-71 school year, teacher unions on the local level have been critical but willing to go along with the experimental programs in order to see what they can accomplish. (But in some areas, such as New York City, unions have brought or threatened to bring court suits to try to block programs.) It is clear, however, that this tolerance may not last if such programs become a continuing and major educational activity.[6]

One basic issue is the relationship of the contract for student achievement to the contract determined by collective bargaining between the union and the school board. The essence of collective bargaining is that the union and management jointly determine conditions of work; in the educational context, teaching procedures are frequently involved in this issue. This leads to a conflict. Some LEAs have argued that so long as teachers remain on the school district's payroll, the requirements of the union contract apply and the union has no interest in the terms of the contract between the LEA and the LSC. The counterargument is that the role and function of the teachers in a student achievement program differ from those in a conventional program, and the change is a proper matter for collective bargaining.

One obvious solution is union involvement in negotiating the learning system contract. LSCs could likewise participate in collective bargaining negotiations, but it is doubtful either the union or the LEA would permit it. In any event, LEA-union relationships are likely to be a critical issue in the next few years.

OTHER CONSIDERATIONS

If contracting for results becomes widespread, it will have a substantial impact on the current roles and functions of teachers and school administrators.[7] The nature of the change can be perceived in the titles that some LSCs with current programs have given former teachers and principals now in their employ—titles such as "curriculum supervisor" and "learning center manager."

Teachers with demonstrated ability to produce achievement gains—as these are measured in such programs—will be in demand. It remains to be seen whether such ability correlates with the qualifications stressed by schools of education and presently valued by school districts. For the time being, at least, any discrepancies will have trivial effects. The present programs make up only a small part of school district activities. A teacher who wants no part in such instruction, or tries it out but is unsuccessful, can be transferred easily. If contracting for results becomes widespread, on the other hand, traditional assignment policies may conflict with the operation of such programs.

Individualized instruction of the type used in many learning centers lends itself to the utilization of paraprofessionals. If paraprofessionals become a large fraction of the staff of LEAs, their personnel policies will have to be adapted. Also, the teacher will become much more of a classroom manager or learning director than he is at present.

Another major issue for teachers is merit pay. Some performance contracting programs provide for bonuses to the teachers, and teacher groups are concerned that such bonuses may eventually lead to the institution of merit pay. This concern may be unwarranted; teacher bonus or incentive provisions are much less common in performance contracting programs than many people believe.

Another fundamental issue is what these programs will do to the relationship between the schools and the public. Many school administrators hope they will increase support for the schools. After all, performance contracting for student achievement demonstrates that the school is trying to respond to public demands for improved compensatory education, improved learning techniques, and accountability. But therein lies a dilemma: if the program fails, the public may berate the school not only for failing to improve educational performance, but for squandering the taxpayers' money on radical schemes. If it succeeds, the public may fear all the more the surrender of public control of education to an education-industrial complex.

The controversy in this area indicates considerable misunderstanding about what contracting for student achievement can and cannot do, and misunderstanding about some of the dangers. First, the mere letting of such a contract will not resolve any of the school's public-relations problems. As discussed previously, a contract is no more than a method; it is not a program, nor are its results a foregone conclusion, good or bad.

The second important point has already been discussed: if school boards and administrators carry out their responsibilities when contracting with LSCs, it is difficult to see any danger that educational control will slip into the private sector.

If they do not, there is a significant danger of improper private influence in decision-making. Whether this would lead to a "takeover" or to nothing more serious than the dismal failure of a program, it is impossible to foretell.

SUMMARY

The goals of the schools have historically been expressed in broad philosophical terms. The demand for educational accountability is resulting in a search for more operational objectives. Objectives that are specified precisely and objectively enough to meet the requirements of internal educational accountability—that are measurable, in short—will probably suffice for educational contracting. At the present time only certain objectives, such as those associated with reading, mathematics, and vocational education skills, appear to have such precise specification.

A performance contract for results is appropriate only if (1) scaleable objectives can be defined, (2) the school believes the contractor has some technological, managerial, or institutional advantage in achieving the desired objectives, and (3) the risk inherent in the operation is too great to allow the use of a fixed contract for results.

Teacher groups or educational firms may have several advantages over local school districts in organizing and operating new and advanced learning programs. First, some of these groups may have an edge in organizational ability. One of the features of many advanced programs is the attempt to change simultaneously a number of dimensions of the learning system. Innovations in materials, environment, classroom organization, and many other factors are attempted in order to reinforce the good effects of single changes. Experience with integrating innovative systems is of great value in these activities.

Second, an outside organization is not committed to the status quo. Outsiders are often able to propose and establish changes in organizational and operational procedures that are politically infeasible for local officials to propose.

A third possible advantage of a large educational firm is the ability to plan and implement changes to ongoing programs. When implementing an advanced learning system, it is likely that once the program is started and achievement results begin to become available, operational, logistic, and management problems will crop up and necessitate changes in program content and organization. Such changes require time and coordination. A large firm with programs in a number of cities may be able to better afford the planning and troubleshooting talent and equipment required in designing and implementing these changes than would a local school.

Finally, the contractor's greatest advantage may simply be the fact that he is held accountable for his results. Immediate monetary incentives are important, but most educational programs are of rather short duration, and the contractor may wish to enter new ones or concentrate on selling his successful materials, techniques, and equipment. In either case, he has a strong motivation to seek a reputation for success rather than maximum profits.

If the district believes that a potential contractor possesses any of these advantages, and if local institutional factors are favorable, a contract for results may be considered.

A number of local educational agencies have found the concept of performance contracting for results sufficiently attractive to initiate experimental programs. Section IV will discuss a number of these specific applications, which illustrate the major conceptual points of Secs. II and III.

IV. CONTRACTING FOR STUDENT ACHIEVEMENT: CURRENT PROGRAMS

This section examines how actual programs have embodied the general concepts of performance contracting, which is being applied in a variety of ways in pursuit of a variety of educational objectives.

CURRENT PROGRAMS

Performance contracting has experienced a sudden growth in popularity. In the 1969-70 school year, only two LEAs had programs. In the 1970-71 school year, probably more than 100 programs are in operation.

Table 1 lists 1969-70 programs. The Texarkana-Dorsett program received great publicity, both favorable and unfavorable. The contract specified a maximum payment of $135,000 and essentially stipulated that Dorsett would receive $80 for each student who achieved a one-grade level advance in a subject in 80 hours of instruction.[1] The contract was part of a five-year, $5-million "dropout-prevention" program financed mainly by U.S. Office of Education Title VIII and Title III funds, with some participation by the Department of Housing and Urban Development's Model Cities program. Although the outcome of this contract is still subject to dispute, this program has been the model for many later performance contracting programs.

While the large-scale, Federally financed program was in operation at Texarkana, the Portland, Oregon public schools were pioneering a different approach. Portland experimented with five very small, locally financed programs during the second half of the 1969-70 school year and the 1970 summer session. These programs are currently being evaluated and compared. Little publicity has been given the Portland experiments, which evince a noteworthy willingness to explore different types of arrangements.

We cannot say exactly how many performance contracts are in operation for the 1970-71 school year, because new programs are being started throughout the year and many have received little publicity. Table 2, however, lists some of the more publicized ones.

Table 1

COMPLETED PERFORMANCE CONTRACTING PROGRAMS

LEA	Date Completed	LSC	Subject	Students		Maximum Payment (approx.)
				No.	Grades	
Texarkana, U.S.A.	Nov 69[a]	Dorsett Educational System	Reading, math	300	7-12	$135,000
Portland, Oregon	Jan 70	Audio-Visual Supply Co. (E.D.L.)	Reading	130	7-8	1,200
Portland, Oregon	Jan 70	Five reading teachers	Reading	140	7-8	1,500[b]
Portland, Oregon	Jun 70	One reading teacher	Reading	55	5-6	1,500
Portland, Oregon	Jun 70	Larrabee and Associates	Reading	200	4-8	500
Portland, Oregon	Jun 70	Six reading teachers (subcontract with Open Court Publishing Co.)	Reading	80	4-8	5,500

[a]This program has been turnkeyed for the 1970-71 school year.

[b]This payment is in addition to regular salaries.

Table 2

OPERATIONAL PROGRAMS, FALL 1970

LEA	LSC	Subject	Students		Maximum Payment (approx.)
			No.	Grades	
Boston (Roxbury), Mass.	Educational Solutions	Reading	400	K-6	$ 80,000
Cajon Valley, Calif.	Macmillan Educational Services	Reading	80	4	55,000
Colorado, State of:	Dorsett Educational Systems	Reading	(300)	(6-8)	(50,000)
Cherry Creek		Reading	100	6-8	
Denver		Reading	100	6-8	
Englewood		Reading	100	6-8	
Dallas, Tex.	New Century	Reading, math	875	9-12	256,000
Dallas, Tex.	Thiokol	Occ. skills, motiv.	875	9-12	208,000
Flint, Mich.	Dealer for E.D.L. Materials	Reading	2,160	9	210,000
Gary, Ind.	Behavioral Research Laboratories	All subjects	800	K-6	640,000
Gilroy, Calif.	Westinghouse Learning	Reading, math	103	2-4	60,000
Grand Rapids, Mich.	Westinghouse Learning	Reading, math	400	1-6	143,700
Grand Rapids, Mich.	COMES	Reading, math	600	6-9	164,000
Greenville, S.C.	COMES	Reading	480	6-9	100,000
Jacksonville, Fla.	Learning Research Associates	Reading, math, social studies, science	300	1	70,000
Oakland, Calif.	Educational Solutions	Reading	400	6-8	80,000
Philadelphia, Pa.	Behavioral Research Laboratories	Reading	20,000	1-2,7-8	800,000
Providence, R.I.	New Century/Communications Patterns	Reading	1,500	2-8	145,000
Savannah, Ga.	Learning Foundations	Reading	875	3,5,6	97,000
Texarkana, U.S.A.	Educational Developmental Labs	Reading, math, dropouts	300	7-12	100,000
Virginia, State of:	Learning Research Associates	Reading, math	(2,500)	(1-9)	(212,500)
Norfolk		Reading, math	500	4-9	
Buchanan Co.		Reading, math	500	1-7	
Dickinson Co.		Reading, math	250	1-7	
Lunenberg Co.		Reading, math	250	4-7	
Mechlenburg Co.		Reading, math	250	4-6	
Prince Edward Co.		Reading, math	250	4-6	
Wise Co.		Reading, math	500	4-9	

Note: Data in parentheses are overall figures for the state's contract.

Most of the contracts in Table 2 are performance contracts for results as defined in Sec. II, but some—notably, the BRL/Philadelphia contract—are fixed contracts for results. Fixed contracts for educational achievement are rare because of the high degree of risk present in the educational process. This is reflected in the relatively high price of the BRL contract—exactly twice what BRL charges for a fixed-resource contract.

A different approach to performance contracting is being attempted in at least five districts (see Table 3). In these programs, as in the programs shown in Table 2, the contractor's fee is related to an output measure, and individualized instruction is viewed as a key to improvement. The approach, however, differs from that of previous programs by concentrating on the teaching function rather than the learning function. The theory is that unless the level of teaching is upgraded the level of student achievement over any long period of time will not be upgraded. The Institute for the Development of Educational Activities (I/D/E/A) is conducting five programs to teach individualized instructional techniques to teachers with in-service training sessions. Criteria for evaluating the teacher's abilities upon completion of the program, which will form the basis for the payments to I/D/E/A, are being developed jointly by I/D/E/A and the local educational agencies.

To round out the 1970-71 performance contracting picture, Table 4 lists the programs being conducted under the Office of Economic Opportunity's social experiment in performance contracting. These programs, unlike the others, are all components of a common program plan and are therefore very similar.

Let us examine in more detail the differences among the various applications of the performance contracting concept.

Table 3

TEACHER ACHIEVEMENT PROGRAMS, FALL 1970

LEA	No. of Teachers in Training Program	Target Payment ($)
Alachua Co., Fla.	40	24,000
Orangeburg, N.Y.	40	24,000
Port Jefferson, N.Y.	30	18,000
Royal Oak, Mich.	30	18,000
Yellow Springs, Ohio	40	24,000

Note: The contractor for all five programs is the Institute for the Development of Educational Activities (I/D/E/A).

Table 4

OFFICE OF ECONOMIC OPPORTUNITY SOCIAL EXPERIMENT PROGRAMS, FALL 1970

LEA	Learning System Subcontractor	OEO Grant ($)[a]
Anchorage, Alaska	Quality Education Development	444,632
Clarke Co., Ga.	Plan Education Centers	301,770
Dallas, Tex.	Quality Education Development	299,417
Duval Co., Fla.	Learning Foundations	342,300
Fresno, Calif.	Westinghouse Learning	299,015
Grand Rapids, Mich.	Alpha Systems	322,464
Hammond, Ind.	Learning Foundations	342,528
Hartford, Conn.	Alpha Systems	320,573
Las Vegas, Nev.	Westinghouse Learning	298,744
McComb, Miss.	Singer/Graflex	263,085
McNairy Co., Tenn.	Plan Education Centers	286,991
New York (Bronx), N.Y.	Learning Foundations	341,796
Philadelphia, Pa.	Westinghouse Learning	296,291
Portland, Me.	Singer/Graflex	308,184
Rockland, Me.	Quality Education Development	299,211
Seattle, Wash.	Singer/Graflex	343,800
Taft, Tex.	Alpha Systems	243,751
Wichita, Kans.	Plan Education Centers	294,700
Mesa, Ariz.	Association of Teachers	33,976[b]
Stockton, Calif.	Association of Teachers	55,154[b]

Note: Each program is for 600 children in reading and mathematics, grades 1-3 and 7-9.

[a]Includes target payment to the subcontractor and $30,000 to $50,000 for the LEA management team.

[b]This payment is in addition to regular salaries.

PROGRAM OBJECTIVES AND SPECIFICATIONS

A major difference among programs is in their broad objectives. A glance at Tables 2, 3, and 4 reveals that performance contracts are in force in large cities, small towns, and rural areas, representing a spectrum of socioeconomic conditions. The number of students involved ranges from 100 to 20,000 and the grades from kindergarten through high school. It is to be expected that the objectives of the various LEAs must also differ.

On the most general level, the pressures discussed in the Introduction to this

study—pressure for accountability, desire to show concern for achievement of minority groups, and so forth—seem to apply in varying degrees to the decisions of the LEAs to try a performance contract. On a more specific level, certain objectives seem to be particularly prevalent.

Many LEAs are looking for a dramatic and immediate improvement in the skills of some group of underachievers so as to brighten up community views toward the schools. In Southern cities involved with desegregation efforts, this consideration seems particularly important.

A second basic objective is to discover new teaching techniques or equipment that can be adopted for the regular program. In such cases the program is viewed basically as part of the LEA's curriculum development goals.

Some programs seem to stem from political considerations. Performance contracting has achieved the status of being "in," and if Federal funds are to be had for the asking, some districts seem inclined to plunge in without much analysis of needs. Ideological elements may also enter. Citizens may argue that "Free Enterprise" has the answers to school problems. Some school officials are in the enviable position of being able to try out a performance contracting program using special Federal funds and, one might say, loaded dice: if the program works, they can take credit for being open-minded and innovative; if it produces no gains, they have evidence that their regular program is as good as any.

Political considerations also affect teachers. Some teachers feel that unless they cooperate they will bring down the wrath of the public, which seeks educational innovation and accountability. In two districts involved in the OEO experiment, teachers' groups have initiated their own performance contracts. One of these programs apparently was founded on the proposition that this type of arrangement was politically inevitable and it was better for teachers to do it themselves than to have an outside firm involved in classroom instruction.

Broad objectives are also likely to depend on which level of government is the sponsor of the performance contract. Many programs have originated at the LEA level. Others—the Virginia and Colorado programs, for example—originated at the state level and the basic project planning took place outside the LEAs. The OEO programs, of course, were sponsored at the Federal level. The OEO projects are unique—and unlikely to be repeated—in that the basic program goal is to compare the contributions of various learning system elements to student achievement.

Program objectives are important for structuring the evaluations of program outcomes. A program in a district where integration is the dominant concern differs from a program sponsored primarily as an adjunct to an LEA's R&D program and should be judged differently.

Differences in program objectives may or may not affect the specifications given to the contractor; regardless of program objectives, the contract objectives may be to work with a specified group of students who need remedial studies and to increase their reading and mathematics achievement to some designated level. Contract evaluation therefore sheds light on but does not answer whether contractual performance has promoted basic program objectives.

CONTRACT OBJECTIVES AND SPECIFICATIONS

Every LEA that has entered into a performance contract with an LSC has contracted out some portion of a reading program. It is relatively easy to set up objectives for these programs, particularly if they are remedial. Most people agree that students who are two or more grade levels behind in reading or mathematics should receive assistance in improving their basic skills.

Some districts, however, notably Gary, Dallas, and Jacksonville, have gone further and contracted for a wider curriculum. These districts apparently believe they have specified meaningful objectives for all the subjects under contract, but payments to the contractors in Gary and Jacksonville are nevertheless based on reading and math achievements.

Contractor responsibility for teaching subjects other than those that determine the fee poses a special issue. It is reasonable to believe that the more time a student spends under a particular contractor's program, the more likely he is to progress in reading. Thus, if other things were equal, we would not be surprised to find the reading programs in Gary and Jacksonville more successful than their counterparts in other districts. This time-allocation might be very useful in upgrading basic skills; however, many educators feel that important educational objectives might be sacrificed in the Gary and Jacksonville programs to achieve reading and math gains.

In the jargon of performance contracting, the contractor's "effectiveness" is the extent to which he achieves contract objectives, a measure commonly related to cost in the term "cost-effectiveness." The cost-effectiveness of a program can be increased by (1) increasing effectiveness for the same cost, (2) lowering the cost while retaining the same level of effectiveness, or (3) some variant combination of the two. Most LEAs are operating at the limit of their budgets. Consequently, when a program is referred to as "increasing the cost-effectiveness" of, say, a reading program, the meaning is almost always that its effectiveness has substantially risen with little increase, or perhaps even a decrease, in cost. All performance contracting programs to date have as their goal an improvement in the effectiveness of an educational program with no increase in cost, or in some cases with a decrease in program costs. Only time will tell how successful they will be. Furthermore, cost-effectiveness gains in reading may not necessarily promote broader program goals.

PROBLEMS WITH TESTING

Data Needs Versus Burdensome Testing

Several problems arise if the contract specifies an objective to be measured by norm-referenced tests. For one, many LEAs have been unprepared for the great amount of testing required, with the possibility of "overtesting." There are, of course, the initial and final achievement tests. A set of diagnostic tests is usually

necessary to structure an individual program for the student. Interim tests will be required, both for payment purposes and so the contractor can modify his program if it is not having the expected results. The district will probably have a regular testing program. Special tests for evaluative purposes may be desirable. All this can put a strain on the bewildered student, and scheduling can become a problem for the school.

Contractors and school officials are properly worried about overtesting, but for the time being there seems to be no escape. We are going through an experimental, evaluative period in the history of performance contracting. Millions of dollars are being spent and perhaps more will be spent in the future, so it would be foolish not to generate the data required for a sound assessment of the concept and its results. Nonetheless, balancing the need for data against the burdens of testing remains a major operational issue.

Measurement Integrity

Clearly, any contractor who is going to be paid on the basis of a test has an incentive to "teach to the test." There is also the obvious temptation, as in the first year of the Texarkana program, for the contractor to go one step further and actually teach the test—instruct the students in some test questions.[2]

If maintaining measurement integrity were the only difficulty with the use of standardized tests for achievement, the controversy could be easily resolved. Rules governing how closely teaching materials may correlate with test questions could be established with serious penalties for violation. This procedure has been adopted in the Jacksonville program. The OEO and Virginia programs have adopted blind testing, whereby the contractor does not know what tests are going to be used. In short, using standardized tests for achievement measures creates contractor-motivation problems, but these can be countered.

Test Results and Educational Goals

Performance contracting has triggered review of the use of standardized tests as a proxy for school output. Increased attention to the relationship between test measurements and school effectiveness has been a collateral but salutary impact of the initial experience with performance contracting.

The discussions have centered on five statistical and conceptual questions:[3] (1) Do standardized achievement tests measure what they purport to measure? (2) Do the tests reflect the content of the performance contracting programs to which they are being applied? (3) Do the tests yield statistically reliable measures of achievement gains? (4) Are the achievement gains measured by standardized tests relevant for the cognitive goals of the schools? (5) Are the achievement gains measured by the tests relevant to the overall goals—including affective and other noncognitive goals—of schools?

To address these questions thoroughly would require far more detail than is

appropriate for this survey of performance contracting; therefore, we shall merely note the importance of the debate about testing and content ourselves with a few words about each question.

With regard to the first question, many tests have technical inadequacies. For example, some require skills different from those that are supposed to be tested; some instructions are difficult to follow; some formats are confusing; and so on. It is certainly desirable that these problems, familiar to the teaching profession but little known outside it, should be aired. These technical problems become even more important when achievement test results are no longer restricted to intraschool purposes—class assignments, counselling, program evaluations, and so forth—but are used as accountability measures and to compute contractor payments. Even so, these tests have long been used and will no doubt continue to be used for a host of educational purposes. To hold that their technical qualities are adequate for traditional purposes but inadequate for performance contracting seems an unpersuasive distinction.

The second question arises because the behavioral elements involved in a performance contracting program are not likely to match exactly those measured by a standardized test. The typical test covers a wider range of skills or subjects than does the typical performance contracting program. Thus, the school and the contractor, unable to find an appropriate test for their program, are forced either to structure the program to the available tests or simply attempt to live with the discrepancies between the course content and the testing instruments.

The reliability issue centers on the errors associated with individual gain scores. The problem is to distinguish "true" gains from the measurement errors associated with any gain score. This task is particularly difficult for programs with short time-spans, such as four or five months, in which the measurement errors can easily exceed the amount of gain involved. Attempting to finesse this problem by using group averages raises the possibility that contractors will focus on some children and ignore others.

The fourth question poses a broader issue. Even if one is satisfied with the measurement properties of the achievement test results, do these results contribute to the basic cognitive goal of improved academic ability? For example, improved reading skill, as measured on an achievement test, should enhance children's enjoyment of reading and inspire them to do more reading on their own. In turn, they should show a general academic improvement in all school subjects. In actual practice it may not work this way. Thus, a recurring question about performance contracting programs is whether the increased ability is retained over some reasonably long period of time, and whether the student can actually turn it to advantage in other areas.

The final question involves the measurement and testing issue, but transcends it. The question really asks if cognitive ability is the proper criterion for judging school success. In addition to cognitive skills, are not affective results important? Also, are reading and mathematics (for which achievement tests are best developed) the areas we want to emphasize to the exclusion of other skills and subject areas?

Because this debate goes so far beyond measurement, we will leave it at this point but will return to it in our consideration of program evaluation.

In sum, the use of standardized achievement tests to define contractors' responsibilities and to compensate them poses significant statistical and conceptual problems. Alternatives to these tests, however, such as criterion-referenced tests, also pose problems. For the near future it appears likely that most LEAs and LSCs will regard the use of standardized achievement tests in performance contracting programs as Hobson's Choice.

LEARNING SYSTEM CONTRACTORS

Contractor Characteristics

The performance contractors are a heterogeneous group, ranging all the way from individual English teachers to subsidiaries of some of the nation's largest corporations. In three of the Portland contracts, the school district contracted directly with its own English teachers. Two OEO contracts involve local teachers' organizations. Most of the other contracts are with private profit-oriented firms.

These firms, however, differ greatly in backgrounds, professional specialties, product lines, and risk-bearing abilities. In general, each firm has followed a different path into performance contracting and each has unique reasons for being there.[4] These firms encompass publishing houses, educational technology firms, educational materials producers, psychological motivation groups, and educational service and tutorial firms; as would be expected, their learning approaches correspond strongly to their general backgrounds.

Every program is predicated on the basis that the contractor has "something new," but the innovation varies greatly from program to program. A few contractors heavily stress new hardware, but most emphasize other innovations. Some stress new materials. Some stress new incentives such as extrinsic motivators. Others stress reorganized classrooms and new classroom management techniques.

The OEO experiment makes considerable use of the differences among LSCs' programs. LSCs were carefully selected to provide a diverse sample of approaches. The sample includes firms that make extensive, medium, and little use of educational hardware, and the programs vary in the extent to which the firms use innovative incentives. The structured context of the OEO project should, therefore, provide considerably more information than is presently available about different technical approaches to performance contracting. Even so, it is doubtful that the issue of preferred approaches will be resolved this year, if ever.

To judge by current programs, any LEA considering a program can choose from a wide and colorful assortment, ranging from cautiously testing the water to some quite novel type of approach. As mentioned above, however, even the most novel programs use materials, machines, techniques, and theories that are more or less familiar to educators, at least in the educational literature.

Most programs embody explicit or implicit plans for later "turnkey" adoption of the LSC's technology—more often implicit. At the moment, most LEAs are adopting a "wait-and-see" attitude before making decisions about the future applications of the programs under way this year.

Contractor Selection

Source-selection procedures can be classified by the point in the development of a program when the contractor was selected; they can also be classified by whether selections are sole-source or competitive. A sole-source selection procedure is almost always conducted early so that the contractor can assist in program development. For competitive bidding, the program must be well structured before a request for proposal can be developed.

Two contractor selection processes are currently in use today in educational performance contracting. In the first approach, the LEA selects a contractor and the two work jointly to develop a program. The basis for contractor selection is seldom made public since it is regarded as an internal LEA matter.

The second procedure is an adaptation of the Federal Government's Two-Stage Formal Advertising method (described in the Appendix). This procedure is strongly advocated by many, particularly by Charles Blaschke of Education Turnkey Systems, Inc.[5] The basic concept is that the LEA develops a set of program specifications before it contacts any LSCs. It then sends out a request for proposal (RFP) to several LSCs, each of which responds with a two-part proposal. The first part details his technical approach to meeting the specifications and his justification for the specific program he proposes. The second part contains his price bid. The LEA first evaluates the technical proposals and then opens the price bids. The contractor judged to have made the most favorable total offer receives the contract.

Educational Turnkey News cites five arguments in favor of competitive bidding.[6] They merit extensive verbatim quotation:

> First, school systems are required by law to accept competitive bids for pencils and papers. Where the very control over and modification of child behavior by outside groups is at issue, should there not be an equal concern for quality assurances and accountability?
>
> . . . . . .
>
> Second, competitive bidding, through the use of "requests for proposals" (RFPs) to qualified bidders, will establish cost-effective standards. A company is forced to submit a proposal, with the cost and level of guarantee reflecting their confidence in their learning system. An RFP also forces them to be competitive, based on their best estimation of the nearest competitor's bid.
>
> . . . . . .
>
> Third, in most instances, when a school system decides to embark upon a performance contract approach, it will be searching for innovative approaches to its existing educational problems. Competitive bidding en-

courages companies to seek out the best approaches and best people in the country to focus in on the particular problem.

. . . . . .

Fourth, the heart of the performance contract approach is the RFP, which does not prescribe how the contractor should do the job, but rather what performance specifications in terms of student achievement are expected of the firm. However, if the school system decides to go "sole source" (as opposed to competitive bidding) to a particular firm, then there are no standards to measure the contractor's proposals other than the potential effectiveness of the methodology. Most likely the guarantees will be less than the firm's *private* expectation, which will be based on its actual previous experience or knowledge of validation results. With proposals from several corporations, however, the approach taken by the contractor is secondary to the levels of guarantee and costs, which can be judged in light of alternative proposals.

Finally, choice among competitive proposals, stated in terms of levels of guarantee and costs, allows lay school board members to allocate program resources on a rational basis.

Unfortunately, the logic for sole-source contracting has not been spelled out so articulately. The basic argument, however, is simple. Performance contracting programs, at least at this stage of the development of the concept, are not like paper and pencils. They are not standardized items. Since the buyer cannot lay down rigorous and detailed specifications, he cannot select among respondents on the single basis of price with full expectation that the amount and quality of the delivery will be as specified.

Instead, the buyer is purchasing a development effort for a product with only dimly perceived characteristics. No one is completely sure what the direct impacts of any project will be or what the side effects (favorable or unfavorable) will be. Consequently, so the argument goes, a performance contracting program is really a partnership in a joint development effort by the LEA and LSC. Partners are not necessarily best chosen in the same way one might purchase light bulbs or school desks. The best recourse may be to select a contractor in whom one has confidence; perhaps the confidence is due to subjective judgments about the potential effectiveness of his methodology. Then the two can jointly develop a program without the constraints involved in RFP specifications and competitive price quotations.

Table 5 indicates the source-selection procedures utilized by a number of LEAs. "S.S." indicates a sole-source selection, "Adv." a competitive selection. Competitive selections were in all cases based on an evaluation of the bidder's proposed results, his technological approach, and his pricing arrangements. Most LEAs in the table engaged in sole-source selections. (Almost half the contractors were selected through competitive procedures, however, as the OEO chose six contractors and Texarkana and Dallas two each.) Organizing a structured, competitive source selection is a difficult and expensive operation. This is reflected in the fact that only those LEAs that had an appropriate amount of managment support have thus far utilized

competitive procedures. As these procedures become better known in the educational community, however, this trend may change.

An attractive variation on conventional source-selection procedures is being used in San Diego, California. EDL (Coast-Visual) has a contract for a reading program in the San Diego School District. This contract is presently a (fixed) resource contract but will supposedly be converted at some time in the future into a performance contract for results. The contract states the intention of the two parties to write a future performance contract based on the results of this year's resource contract.

Table 5

SOURCE SELECTION OF LEARNING SYSTEM CONTRACTORS

Educational Agency	*Selection Procedure*
Boston, Mass.	S.S.
Colorado, State of	S.S.
Dallas, Tex.	Adv.
Flint, Mich.	S.S.
Gary, Ind.	S.S.
Gilroy, Calif.	S.S.
Grand Rapids, Mich.	S.S.
Greenville, S.C.	S.S.
Jacksonville, Fla.	Adv.
Oakland, Calif.	S.S.
OEO Programs	Adv.
Philadelphia, Pa.	S.S.
Portland, Ore.	S.S.
Providence, R.I.	Adv.
Savannah, Ga.	S.S.
Texarkana, U.S.A.	Adv.
Virginia, State of	Adv.

PROGRAM RISKS

Two types of uncertainties are associated with a performance contracting program. First, there is the uncertainty directly associated with the program outcome —how much the students will learn and, consequently, the payment to the contractor. Second, there is the uncertainty of "side effects" from the contract. At present, little is known about either type of risk and few general statements can be made.

Arrangements providing for lower prices for lower levels of achievement remove only a portion of the outcome risk from the LEA. Seldom if ever will an LEA be able to offset the failure of students to progress satisfactorily in a subject by pointing out that the contractor received little or no payment. (This is the major reason that considerable care must be exercised in evaluating "competitive" bids based upon different learning systems. As discussed in the Appendix, where the final payment is a variable based on an uncertain outcome, comparison of two price bids is difficult.)

Most performance contracting programs for student achievement involve some novel innovative educational technology, technique, or method or combinations thereof. If they did not, it is doubtful that the LEA would have considered contracting for results. These "learning systems" have all been tested and demonstrated to some extent, but most are now being utilized in significantly different settings from those in which they were tested. Their effectiveness in the new settings is uncertain; each LEA must make its own estimates of the probable effectiveness of each system.

PROGRAM COSTS AND CONTRACT PRICES

Tables 1 through 4 contain information on "maximum payment," but this information is of very limited value. Undoubtedly, some performance contracting programs are substantially more expensive than others, but valid comparative data cannot be derived from the tables. In fact, the term "payment" can be misleading. Payments definitely are not comparable between programs. First of all, since these are performance contracting programs, payments cannot be determined until the end of the contractual period. A maximum payment figure is useful information only in that it sets an upper limit on the LEA's liability to the contractor for that contract. Furthermore, the "maximum price" does not always represent the total program payment that the contractor may receive, because in some cases the contractors are also selling consulting services, equipment, and materials to the LEA under separate contracts. Finally, the "maximum payments" are almost never representative of the LEA's *program* costs.

For analysis, program costs may be classified in many ways. Table 6 gives one possible breakdown. The primary distinction in this classification is between acquisition (or start-up) costs, which are applicable to the entire life of the program, and operating costs, which are incurred on an annual or a monthly basis. Even if exactly the same program were set up in two districts, their program costs would probably differ as both salaries and resource prices differ from place to place. In comparing performance contracting programs the situation is much more complex than this, however.

Performance contracting programs differ widely in their educational technologies. These differences lead to various combinations of salaries, facilities, equipment, materials, and training costs among programs, and, more important for cost com-

Table 6

COST STRUCTURE FOR A PERFORMANCE CONTRACTING PROGRAM

Acquisition Cost	*Operational Cost*
Program implementation	Salaries:
Equipment	Teachers
Program-related	Paraprofessionals
Student-related	Specialists
Materials:	Other
Program-related	In-service training
Student-related	Materials and supplies:
Preservice training	Program-related
Facilities (space)	Student-related
Installation	Facilities O&M
	Contracted services
	Media services
	Transportation

parisons, to different mixes of acquisition and operating costs. Some programs are capital-intensive and have relatively high initial costs. Other programs require nominal capital charges but utilize large amounts of consumable materials. These programs may require lesser expenditures in the first year of operation, but over a five- or ten-year period may be more expensive than the capital-intensive programs.

The allocation of costs between the LEA and the LSC also vary greatly. It is possible that in some programs all costs are the responsibility of the contractor and are covered by his performance contract; however, it is not possible to single out any programs where this is the case because few of the LEAs keep a reliable compilation of program costs, and what information there is has not been publicized. It is more feasible to discuss the cost categories that are known to be borne by the contractors and to assume that the others are borne by the schools.

In those contracts that have been let to date directly with teacher groups, few costs are covered—often not even the basic salaries of the teachers. Some teaching materials are covered and, in the OEO contracts, some monies for student incentives. The major portion of the contract price, however, is made up of incentives for the teachers.

In the other contracts the reverse is true. The majority of the contract price represents costs assumed by the contractor and a small portion represents the incentives. These contracts, however, vary enormously in their cost coverages.

In some programs the contractor is responsible for very few cost elements. In Philadelphia the BRL contract is only for materials and some counseling and training, as was the Open Court program in Portland. The EDL contract in Flint, as well as the completed EDL contract in Portland, is for equipment, materials, and consulting. In all of these cases the contractors are simply supplying educational materials to the districts and training the districts' teachers in the use of materials. In each

case, however, the price for the materials is contingent upon the achievement of the students in the programs.

Teachers' salaries are the major item in most educational programs. Local teachers are utilized in most programs, and they often remain on the LEA payroll to simplify fringe benefit and tenure provisions. A few programs have used outside teachers. In the early performance contracts (Texarkana in 1969-1970, and most of the OEO contracts) the contractors assumed the salary costs. This led to problems associated with retirement funds and tenure considerations as well as professional responsibilities, however, and schools are now paying salaries in most of the other programs.

Some programs are conducted in elaborately restructured "classrooms"; the construction or conversion costs are borne in some cases by the schools and in others by the contractors. Equipment is sometimes purchased by the school, and sometimes its "rent" is covered by the performance contract. In some programs, consumable materials are sold to the school and are not covered by the contract.

For all of these reasons, *program cost* should never be confused with *contract payment* in discussing a performance contracting program. Program costs will likely exceed contract payments, and an LEA should base decisions on the total costs of the program, not merely on what it may have to pay the LSC. Unfortunately, at the present time little general information is available on program costs. Contractor A may "charge" $50 per achievement year and Contractor B may "charge" $200, but the LEA must make its own estimate on what the achievement year will cost, considering both the probability of achievement goals being reached as well as the costs not covered in the contract.

PROGRAM SUPPORT

Some school districts rely entirely on their own capabilities in setting up and conducting a performance contracting program with an LSC. Others call on other public or private organizations for assistance. There is considerable difference of opinion about the preferred practice. One position is that, in addition to the contract with the LSC, school districts are generally well advised to let some additional support contracts, including a contract with a management support group and another with an independent educational auditor.[7] Many other knowledgeable officials, including many LEA officials, feel that such activities are best conducted by regular employees of the school system.

Those advocating the use of an outside management support group see it as having three functions. The first is to provide assistance for both program and contract planning and development. Such activities as analyzing needs, developing the school district's Request for Proposal (RFP), and developing lists of bidders to be solicited are cited as activities in which a support firm can be extremely valuable. The second function is to provide ongoing management assistance during the program. The third is to act as an "honest broker" between the LSC and the LEA and

resolve problems, deal with complaints, and weigh proposals for changes that arise during the program.[8]

There is definitional confusion about the roles of "independent evaluator" and "independent auditor." Some authorities view the auditor's function as helping the LEA to prepare an evaluation plan for the evaluator to carry out, and at the end of the program certifying to the LEA that the evaluation has been properly performed. In some programs—for example, in Texarkana—the audit function has been provided by a firm with no other program responsibilities. In others, such as the OEO programs, the management support group also operates as the auditor. The evaluator's function, if one follows this semantic usage, is to carry out the audit plan and certify, to the LEA and the contractor, the gains achieved in the program and therefore the payment required to discharge the contract. Other educational authorities do not distinguish between evaluation and educational audit, but regard them as a single function.

Neither of these views has gained wide acceptance, probably because neither has ever been completely spelled out in unambiguous terms. A third view has received little attention but is both logically and operationally superior to the other two. This view identifies two distinct evaluations, one mandatory and one recommended, to be performed for every performance contracting program. The first is a *contract evaluation* that determines whether the LEA and LSC have performed their respective duties under the terms of the contract, and calculates the amount of the contractual payment. This evaluation must be performed. Secondly, there may be a *program evaluation* concerned with the educational program. It would cover both the contracted and uncontracted portions of the program, and planning as well as execution.

At the present time, "independent evaluators" or "internal evaluators" are usually concerned with contract evaluation, and "independent educational auditors" are usually concerned with program evaluation, but confusion prevails concerning both titles and functions. As the accountability and performance contracting movements progress, however, it is highly likely that the terminology of "contract evaluator" and "program evaluator" will gain wide acceptance.

Regardless of definition, in many programs management support, contract evaluation, and program evaluation are being provided by one or more private firms. Table 7 lists the support contractors for our sample of programs. Advocates of support contractors essentially see three virtues in their use. The first is good contracting practice. Gains are determined by some agency not directly affected by the contract between the LSC and the LEA. Also, supporters of this procedure point out that few school districts have much experience with this type of contracting and lack the expertise that support firms can provide.

A second alleged benefit is political credibility. The use of specialized management firms is believed to demonstrate the seriousness of the LEA's desire to implement modern management methods. The use of independent evaluators and educational auditors is supposed to demonstrate the LEA's willingness to be held accountable and have its performance objectively assessed.

The third benefit is a more long-run advantage. The outside participants, it is

Table 7

PROGRAM SUPPORT CONTRACTS

Educational Agency	Management Support	External Evaluator	Educational Auditor
Boston, Mass.	—	Heuristics, Inc.	—
Colorado, State of	—	Univ. of Colo.	—
Dallas, Tex.	G.C.S.	—	E.T.S.
Flint, Mich.	—	—	—
Gary, Ind.	—	CURE	—
Gilroy, Calif.	—	—	—
Grand Rapids, Mich.	—	—	—
Greenville, S.C.	—	—	—
Jacksonville, Fla.	Metametrics	Metametrics	E.T.S.
Oakland, Calif.	—	—	—
OEO Programs	TKEY	Battelle Inst.	TKEY
Philadelphia, Pa.	—	—	—
Portland, Ore.	—	—	—
Providence, R.I.	Metametrics	Metametrics	—
Savannah, Ga.	—	—	—
Texarkana, U.S.A.	TKEY	ESC-M	EPIC
Virginia, State of	TKEY	Univ. of Va.	—

Note: G.C.S. = Research Council of the Great City Schools
EPIC = EPIC Diversified Systems Corp.
CURE = Center for Urban Redevelopment in Education
E.T.S. = Educational Testing Service
TKEY = Education Turnkey Systems, Inc.
ESC-M = Educational Service Center, Magnolia, Ark.

hoped, will furnish the impetus for development and implementation of new programs, new procedures, knowledge about input-output relationships, and the like.

Those who favor performing most of these functions in-house cite several considerations. First, support is expensive. The amounts budgeted for support in most programs are small when one thinks of the cost of a man-month of effort from an educational consultant. Nonetheless, despite the modest amounts spent (and therefore the modest amount of professional time that the support firms can provide), use of contract support services requires funds that could be spent either on the learning system contract or in developing in-house personnel. Second, it is sometimes argued that school district personnel need direct experience with these programs in order to develop basic capability.

A third consideration is always inherent in the use of contract support in any context. This danger might be called the "let George do it" syndrome. It is always

easy for an executive faced with a hard problem or a complex task to turn the matter over to an outside firm and dismiss it from his mind. One danger here is that the required interaction between the support group and operating personnel will not come about. Also, the responsible decisionmakers will not be in a position to provide guidance to or understand the activities of the support firms. Improperly used, outside support can cause a project to become sealed off from the parent system, thereby greatly increasing the possibility that the system will reject its results.

SOME IMPLICATIONS

Performance contracting has grown fast. LEAs have come to view it as a promising instrument for achieving a wide array of objectives. It is important to keep in mind, however, that performance contracting is a technique for addressing educational needs; it is not a program in itself, nor does it furnish ready-made solutions.

In one sense, educational performance contracting is very broad; in another sense it is very limited. To date, few programs involve subjects other than reading and mathematics, largely because of measurement problems in other areas. Even for reading and mathematics, the use of norm-referenced achievement tests as measures of educational output raises many operational and philosophical problems.

A third implication is probably the most important. Performance contracts involve more than merely the portion placed under the cognizance of the contracting LSC or teacher group. Evaluations should therefore take the overall program into account, and not concentrate exclusively on determining achievement gains and the amounts the LEA owes the contractor. First, the contribution of achievement gains to broader program objectives, such as desegregation, curriculum improvement, and heightened community support should be investigated. Second, since a performance contracting program involves the activities not only of the LSC but of the school district and perhaps other contractors, the effectiveness and cost of all the contributions should be examined. Third, a performance contracting program is likely to generate impacts other than those on student achievement. It will probably have affective or volitional impacts on students. It will surely have some impacts—positive, negative, or both—on teachers and school officials. It may have parental and community impacts. All are relevant.

At first blush, the prescription for applying the performance contracting concept to education appears disarmingly simple: "Call in an LSC and let a contract specifying various levels of achievement. Then give a test at the start of a program and at the end, compute the gain, and pay off the LSC." In fact, the problem is far more complex than this, and it is no easy matter to judge a program's relative success or failure, to say nothing of the *causes* of success or failure. We do not advocate vague, qualitative assessments of performance contracting. Hard, analytical evaluations are obviously needed, and it will be a challenging but clearly vital

task to design relevant evaluation methods for performance contracting programs. Designing and implementing such evaluations may turn out to be the most difficult problem the performance contracting movement must face, considering the current state of the art of both performance contracting and educational evaluation.

V. SUMMARY AND CONCLUSIONS

Performance contracting was first applied to the education of public school students late in 1969. The publicity associated with the initial program has inspired widespread interest in and experimentation with the method. In typical applications of this method, a local educational agency (LEA) contracts with a learning systems contractor (LSC) for the education of a selected group of students, with the contract payment determined by the measured achievement of the students. Payment for services on the basis of student achievement and the involvement of private, profit-oriented firms in classroom activities have made performance contracting one of the most hotly debated innovations in American education.

Three points merit particular emphasis. First, there is a large number of operational programs at the present time, but they are all experimental and most are narrow in scope. Second, these programs are so diverse that statements and judgments concerning one program may be completely irrelevant with respect to the others. Third, there is great need for broad evaluations of these programs.

Programs can differ in a variety of ways: in the characteristics of the educational programs, the portions of the programs under contract, the terms of the contracts, the characteristics of the contractors, and the contractors' learning programs.

The major similarity among the programs is that each involves a reading program, usually remedial. Many also include mathematics, but only three cover other subjects. Behavioral Research Laboratories (BRL) is teaching the entire curriculum for one elementary school in Gary, Indiana, but their payment will be based only on the students' achievement in reading and mathematics. Jacksonville, Florida, has let a contract for the basic curriculum for a first grade class, and in Dallas some vocational skills are being taught under contract.

Performance contracting for student achievement requires that the LEA be able to specify acceptable levels of contractor performance, and therefore that objective measures of performance be devised. At present, most educators believe that such specification and measurement is possible only for such basic subjects as reading and mathematics, and many educators are dissatisfied with present testing instruments even for these subjects. The expansion of performance contracting will

probably depend heavily on the development of improved norm-referenced and criterion-referenced measures of achievement.

Since the prices for the different contracts vary widely, mostly because of differences in the amount of the educational program contracted out, no wholly valid comparisons among prices are possible. For example, in some programs the contractors are simply furnishing books or materials, while in others they are responsible for the entire range of classroom resources; and in some programs the teachers remain on the district payroll, while in others the contractors are responsible for teachers' salaries.

The LSCs are a heterogeneous group. They range from individual English teachers to subsidiaries of some of the nation's largest corporations. At present, however, most contractors are profit-oriented educational firms.

In most of the programs the contractors are directly involved in the classroom teaching and learning process. There are differences of opinion about whether this involvement will continue in the future, however, even among the private firms, most of which are basically developers and marketers of educational research and development. Some contractors view their classroom activities as a rapidly passing phase. Soon they hope to be only consultants assisting school districts with "turn-keyed" systems, that is, learning systems operated by the district as part of their regular programs. Other contractors question whether the current phase will pass so rapidly.

Curricula and teaching techniques are disparate. While most programs are based on highly individualized instruction, approaches and techniques vary substantially. Some LSCs use teaching machines extensively. Others use no machines or, at most, simple cassette-players. The majority fall somewhere between these two extremes. Some programs emphasize extrinsic incentives; others rely exclusively on intrinsic motivation. Some stress the importance of changing the classroom environment. Some use new materials, others use only well-known materials. This heterogeneity should not be surprising, since performance contracting is not in itself a program but a method for attaining different types of objectives.

A school district can contract for goods and services in a variety of ways, and each contracting method has advantages and disadvantages. There are two basic types of contracts: contracts for resources, and contracts for results. Each type may be further distinguished by whether it specifies a single acceptable outcome and a single acceptable payment, or a range of acceptable outcomes and payments. The latter type of contract is called a performance contract.

Four basic considerations are important in contract type selection: (1) the amount of risk inherent in the operation; (2) the relative technologies and management skills of the two parties to the contract; (3) institutional considerations; and (4) other intangible considerations. These considerations determine the most appropriate type of contract for a specific situation. It must be emphasized that there is no universally preferred type of contract. Performance contracts for results may be preferable in some situations, for example, but completely inappropriate in others.

The most important factor in determining which types of contracts may be used in a particular situation is the nature of the contractual outcome. Any contract

for results requires that the product to be delivered must be capable of precise definition. Performance contracting has a more rigorous requirement: that the contractual object be objectively measurable over a range of acceptable levels.

The methods that may be used in choosing contractors also depend on the nature of the contractual outcome. Price competition requires that the contractual outcome (whether it is a resource or a result) must be precisely specified. If the outcome cannot be precisely specified, some form of nonprice competition or sole-source negotiation must be used.

Historically, the goals of education have been expressed in broad philosophical terms. The educational accountability movement is stimulating the formulation of more operational definitions of objectives. Objectives that are specified precisely and objectively enough to meet the requirements of internal educational accountability will serve equally well for educational contracting.

An often-encountered argument in favor of performance contracts is that private educational firms have an advantage over local school districts in the conduct of educational research and development, but have had no means for demonstrating their new products or methods in a setting that is persuasive to local school authorities. Performance contracting for student achievement provides such a means.

Legal considerations and the attitudes of such groups as teachers unions must be considered in evaluating the appropriateness of any contract for educational achievement. Legal requirements prohibiting publicly constituted bodies from contracting away their responsibilities require careful consideration in structuring educational performance contracts, but it does not appear that they will pose a major block to the broad application of performance contracting. In general, teachers unions on the local level have been critical but willing to go along with the experimental programs to see what they can accomplish. It is clear, however, that this tolerance will not last if such programs become a continuing and major educational activity. National groups such as the American Federation of Teachers have vigorously opposed performance contracting and are likely to continue their opposition to both the accountability movement and the movement toward contracting for educational achievement.

The real strength of performance contracting is its versatility—its potentiality for use in a wide variety of contexts. This implies, however, that all performance contracting programs should be evaluated with a very broad perspective. Faults will be discovered in each program, but the central task is to determine whether they are peculiar to that program, contract, and contractor, or whether they represent basic defects in the performance contracting concept. If program evaluations are thought of simply as contract evaluations—that is, if they focus solely on measured achievement gains and payments to contractors—much information will be lost. Every educational agency should conduct both a comprehensive program evaluation and a contract evaluation.

For the present, a performance contract can usually have only very limited objectives, since they must be stated very precisely. The contract typically encompasses only a portion of the educational program; every effort must be made to

ensure that the objectives of the contract harmonize with overall program objectives.

Contract evaluations must be conducted to determine whether all obligations were fulfilled and to determine the payment due the contractor. This is a necessary step, but a further one is needed. The full value of a completed program can be determined only by weighing the contractor's contributions to the school's overall program objectives, and then fully evaluating the entire program. Evaluation is likely to prove the most difficult task in performance contracting.

Appendix

SOME CONTRACTING EXPERIENCES IN OTHER SECTORS

Many of the problems encountered in developing performance contracts for educational services have counterparts in the procurement of goods and services in other areas. A few accounts of contracting situations in other sectors will provide a useful perspective. The discussion is divided into two parts. The first briefly describes some aspects of the problem of project/product definition as it occurs in hospital services, major defense systems, and NASA procurements. The second section considers the use of incentive fee arrangements in defense contracts and in one Job Corps project.

PROJECT/PRODUCT DEFINITION

Hospital Services

Hospital services share many of the same problems encountered in the provision of educational services. Hospital costs are rising more rapidly than any other component of national expenditures, with attendant public dissatisfaction. Several factors weaken the incentive to provide effective and efficient but low-cost care; there are even incentives against doing so. As in education, analysis and change are hampered by the problem of defining objectively the output of the medical sector.[1] Most significant, potential innovations and structural change must take into account impacts on product quality.

Hospital charges have been increasing at a startling annual rate of about 13 percent since 1966, and accelerating.[2] Hospital rooms have become luxury accommodations, with room charges of $60 to $100 a day being common. This trend has led to the creation of various insurance schemes and the development of a class of third-party payors.

Most patients now refer their bills to Blue Cross, some other insurance company, or the Federal Government for payment as part of the Medicare or Medicaid programs. The patients pay only the coinsurance portion of the bill. Of course, this third-party role does not eliminate concern about costs; it merely transfers the concern from the patient to the Government and other insurers. However, an agency such as Blue Cross may be in a better position than an ailing patient to evaluate a hospital bill and bargain with the hospital if it appears unreasonable. The problem of whether hospitals are providing the socially optimal cost/product combination remains unaffected, however, by whether an insurer or a patient pays most of the bill.

There are substantial theoretical grounds for believing that hospital care is nonoptimal.[3] Schultze has aptly summarized the problem:

> Essentially each hospital is reimbursed by the Federal Government for the "reasonable costs" of delivering services to patients under medicare and medicaid programs. Payment is matched to the individual costs of each hospital. There are virtually no incentives for efficiency. Any savings from more efficient operations result in lower Federal payments; any increased costs are fully passed on. To the extent that larger staffs bring prestige and promotion, there are positive incentives for inefficiency. Moreover, since policies in most hospitals are controlled by the physicians serving it, and since the hospital provides, in effect, a free workshop for those physicians, there are powerful incentives to upgrade the workshop, when the costs are reimbursed, insofar as most patients are concerned, either by Government program or private insurance carriers.[4]

These incentives have resulted in American medical care being characterized as a "Cadillac only" industry. Newhouse has provided a convincing price-theoretic analysis of why the nonprofit status of most hospitals leads to this bias toward abundant use of high-quality inputs even though a less elegant product might suffice and at the same time be less of a financial burden.[5] The essence of the problem is that, in any system where the supplier is paid for his production costs, he has no incentive to provide either an efficient or an austere product; in fact, he has exactly the opposite incentive. As long as it benefits producers to spend more, they will continue to do so. The motive is not merely cynical greed or indifference. Most professionals and craftsmen take pleasure in having the best materials to work with, and having them in abundance; they also enjoy virtuosity. This attitude is conducive to high quality, and we clearly do need high-quality medical care, even if we wish to avoid "gold-plating." The task is to combine high quality with efficiency.

Countervailing incentives could be built into the hospital system. For example, instead of paying hospitals on the basis of their individual costs, some average cost figure could be reimbursed. Hospitals with less than the average cost per patient day would acquire funds to use in a discretionary fashion. Hospitals with above average costs would have to make up deficits from contributions, patient charges or cost-cutting elsewhere.

The problem with all such schemes is that they run the danger of discriminating against hospitals that are cost-effectively providing an above-average quality of services. Schultze sums up the central issues:

> Incentives schemes, however, will ultimately prove viable only to the extent we can distinguish change in cost for a constant quality of care from changes in cost associated with changes in quality. We seek a means to reduce hospital costs per unit of output. We do not seek a reduction in per diem costs achieved by lowering the quality of care provided.[6]

Some method is needed for defining and assessing the quality of the product, and several possibilities have been suggested.[7] One is peer-group reviews.[8] Peer-group evaluations have a well-established role in medicine, but they have never been used for output-quality assessment in the manner contemplated by those who would use the procedure for contracting purposes. Hospitals have tissue review committees, death committees, committees that automatically review cases every 14 days in the hospital, and a variety of other peer-group evaluation boards. It is a controversial issue whether peer-group review practices can be extended from examinations to determine if accepted professional practices were followed to examinations of whether efficient procedures were used. Nonetheless, The American Medical Association has been advancing suggestions for the peer-group review approach. Doctors seem concerned that unless some such approach is adopted, governmental units will establish audit committees with "outsiders" such as lawyers or economists having authority to make quality judgments.[9]

Another suggested approach is based on the coinsurance feature of most insurance arrangements. It would vary the extent of coinsurance—the amount paid by the patient—with the cost category of a hospital; that is, the patient would have to pay less coinsurance if he picked a less expensive hospital. The authors of this approach believe it would prompt consumers and their physicians to study and evaluate cost/quality tradeoffs in hospitals.[10] The degree to which medical care consumers are qualified to do this remains somewhat questionable in our minds.[11] In any event, this procedure apparently has less chance of being implemented than does some form of audit or review committee.

In short, hospital care is another area where new incentives and new contracting techniques are much needed, but any major change in procedures will have to await a better definition of product quality.

Defense Procurement

A central aim in all the attempts since World War II to rationalize defense procurement has been the development of quantitative measures of the performance of defense systems and their contribution to the output of the defense establishment. At first many people regarded this as a quixotic task. The job of the military services is to provide national defense. How can this "output" be measured?[12]

In economic terms the answer is that, strictly speaking, the military establish-

ment does not "produce" national defense; it engages in a number of activities that in sum provide us with a capability or posture that deters or overcomes enemies. If one focuses not on the ultimate goal—national defense—but upon the constituent outputs of the various defense components, a great deal of objective product definition and measurement is possible. Put differently, proximate and measurable measures of defense effectiveness can be obtained.

The analytical accomplishments in the defense area spawned many efforts in other areas of Government expenditure to define output and objectively analyze the effectiveness of policies and decisions.[13] It will be appropriate to examine some of the accomplishments and failures in measuring defense outputs.

The military frustrations of the last few years have led to much criticism—both justified and unjustified—of quantitative measures of defense output, but let us begin with the accomplishments. The chief accomplishment in the defense area was to link planning to budgeting by focusing on measures of output. In the traditional Federal agency, two groups exist side by side with little direct interaction and, frequently, mutual distrust. The first group is the planners, who are supposed to produce a coherent set of programs for the agency to meet its goals. Typically, the group operates on the tacit assumption that resources are unlimited, and is prone to issue publications with high-sounding titles ("The Challenge of the 70's for . . .").

The second group is the budgeteers. They keep track of the inputs funded by Congress; their chief output is budget proposals for Congress and the Office of Management and Budget. The budgets are often prepared by simply extrapolating past programs, or adding a few new programs and holding everything else constant, or applying the principle that the "squeaking wheel gets the grease," or some combination of these techniques.

As long as budgeting takes place on the basis of inputs, and planning takes place on the basis of program opportunities, the activities of the two groups will seldom intersect. But without such intersection it is likely that (1) meritorious programs will not be funded, (2) programs that have outlived their historical usefulness will be funded, (3) budget increases or cuts will be distributed randomly with respect to usefulness.

Once measures of output—even proximate measures—are defined, it is possible to bring the planning and budgeting process together. This may be done formally through program budgeting systems and cost-effectiveness analysis, or more informally. In the Pentagon, output definition provided the framework for the PPBS (Program Planning and Budgeting System) and the system-analytic capability that provided defense decisionmakers with considerably improved visibility and civilian control over the system, and considerably better integration of information.

Good measures of output, let it be repeated, are crucial to quantitative analysis. Unfortunately, in the military area as well as elsewhere, obtaining such measures is difficult and problems abound. Three problems are especially significant. First, military capability can seldom be directly measured; proximate measures must be selected and the closeness of the proxy is usually uncertain. Second, most outputs are multidimensional and frequently some dimensions are not quantitatively measurable; it is easy to concentrate on the measurable dimensions and forget

about the others. Third, people have sought to answer inappropriate questions by use of output measures. Let us briefly examine each problem.

The first problem arises because one is almost always using some proxy for the measure he would like to have. Measures of effectiveness, system characteristics, or output are seldom direct measures of system performance. Frequently, one does not have the time or information to determine how adequate the proxy measure really is. Too frequently, it is a Hobson's Choice—the proxy measure is the only measure. The important point is that use of a proxy rather than a direct measure can bias results.

The second problem with output measurement is that a system usually has a number of different products, only some of which are quantifiable. The current ecological situation is a pertinent example. Our concentration on producing tangible goods and services has led to a decline in many intangible products that are usually lumped together and called "quality of life." Some aspects of "quality of life" might be specified and measured if we took the effort to do so; others will probably always defy quantification. The significant point for this discussion is that in analytical work, development, contracting, and like arrangements, it is always easy to focus on the aspects of a project or program that can be reduced to numbers, and to overlook those aspects that cannot. Serious repercussions can ensue.

The third problem—use of output measures to answer inappropriate questions—is more a problem with analysts and decisionmakers than with output measurement itself. Obtaining a good quantitative measure for some objective does not necessarily answer the question of what to do with respect to this objective. Many examples of confusion on this point could be cited from the military sector, but perhaps an educational example is more pertinent. Obtaining good measures of the affective impacts of schools would still not resolve the basic social issue of how much responsibility schools should assume for noncognitive achievements. True, better measures of the affective outputs of schools and school systems are desperately needed, but we should not expect such measures to supply direct answers concerning the choice of school objectives.

INCENTIVE FEES IN CONTRACTS

Department of Defense Procurement

The authors of the Procurement Act of 1947, the foundation for defense procurement policy, deliberately established few constraints with respect to contractual instruments. Only one type of contract was prohibited for use by Government contractors, the Cost Plus Percentage of Cost (CPPC) contract. This instrument has inherently perverse managerial incentives, since the more an item costs the more profit the contractor earns.

The Act requires that, whenever possible, procurements should be based on a detailed specification of the product or service desired, with contracts awarded

following an advertised formal price competition. Advertising implies a Firm Fixed Price (FFP) type of contract.[14] When advertising is not used, a wide range of contract types are available for use. At one extreme are the FFP contracts. Then there are the incentive contracts, most notably the Fixed Price Incentive Fee (FPIF) contract and the Cost Plus Incentive Fee (CPIF) contracts. At the other extreme are the cost reimbursement contracts: the cost only (CR) and the Cost Plus Fixed Fee (CPFF) contracts for use when a full range of resources are being procured, the Time and Materials (T-M) contract when only labor and materials are being procured, and the Labor-Hour (L-H) contract when only labor is procured.

The distinction we have drawn in Sec. II between contracts for resources and contracts for results is not found in the Procurement Act nor in the Federal procurement regulations. These regulations continually refer to "the uncertainties of performance" and "cost uncertainties" in discussing the appropriateness of the different types of contracts. The implications of the distinction between resource contracts and contracts for results, however, are clearly present. Fixed price contracts, whether formal advertising is employed or not, must be associated with a fully specified product; that is, they are contracts for results. Incentive contracts require that contract costs be monitored. However, these contracts (that is, the CPIF as well as the FPIF) must also be contracts for results, since otherwise there could be no benchmark by which to compare actual contract costs with target costs.[15]

Cost reimbursement contracts, on the other hand, are resource or employment contracts. They call for "best efforts" but do not require the production of results. This is clearly spelled out in Armed Forces Procurement Regulation (ASPR) 7-203.3 for cost-reimbursement contracts:

> (a) It is estimated that the total cost to the Government for the performance of this contract, exclusive of any fee, will not exceed the estimated cost set forth in the Schedule, and the Contractor agrees to use his best efforts to perform the work specified in the Schedule and all obligations under this contract within such estimated costs. . . .
>
> (b) Except as required by other provisions of this contract specifically citing and stated to be an exception from this clause, the Government shall not be obligated to reimburse the Contractor for costs incurred in excess of the estimated cost set forth in the Schedule, and the Contractor shall not be obligated to continue performance under the contract (including actions under the Termination clause) or otherwise to incur costs in excess of the estimated cost set forth in the Schedule, unless and until the Contracting Officer shall have notified the Contractor in writing that such estimated cost has been increased and shall have specified in such notice a revised estimated cost which shall thereupon constitute the estimated cost of performance of this contract.

Table 8 summarizes these relationships between the Federal contract types and our distinction between contracts for results and for resources. These relationships provide a useful context for the remainder of this Appendix.

Table 8

CLASSIFICATION OF FEDERAL CONTRACT TYPES

Contracts for Results

Fixed Price Contracts:
- Firm Fixed Price ..... FFP
- Fixed Price Redeterminable ..... FPR

Incentive Contracts:
- Fixed Price Incentive Fee ..... FPIF
- Cost Plus Incentive Fee ..... CPIF

Contracts for Resources

Cost Reimbursement Contracts:
- Cost only ..... CR
- Cost Plus Fixed Fee ..... CPFF
- Time and Materials ..... T-M
- Labor-Hour ..... L-H

Despite the wide flexibility allowed under the Procurement Act of 1947, for some years most defense contracts had a firm-fixed-price (FFP) or fixed-price redeterminable (FPR) arrangement.[16] Starting in the 1950s, cost-plus-fixed-fee (CPFF) contracts gained in popularity to a peak in the first nine months of FY 1961, when 38 percent of the defense contracts (by dollar amount) contained CPFF provisions.

Defense Secretary Robert S. McNamara then introduced a major drive to reduce the amount of CPFF contracting. He admitted that to a considerable extent the increased use of CPFF contracts reflected the complexity and sophistication of post-World War II defense hardware. Nonetheless, he argued, even if fixed-price contracting were infeasible, other incentives could and should be used to overcome what he saw as a costly pricing arrangement.[17] As he explained the disadvantage of CPFF contracting:

> I think the waste under cost-plus-fixed-fee contracts is a function of two factors: First, such contracts are frequently let by the Department of Defense before the Department itself has fully defined the job to be performed either in terms of quality, quantity, or time. Obviously, if it has not made its requirements clear, the contractor can't be clear as to how he should perform that contract.
>
> But secondly, even if the Department has precisely defined its requirements, if it is a cost-plus-fixed-fee contract, the contractor may accept the contract before he has undertaken the planning to insure that he will apply the most efficient process or method of producing the item. Either one or both of these factors will introduce serious inefficiencies into the contract's cost.[18]

Secretary McNamara believed that even if the CPFF contract could not be replaced by the FFP contracts, it could be replaced by some more product-oriented

contract type. Accordingly, during the 1960s there was intense DOD interest in "incentive" and cost-plus-incentive contracts as "halfway houses" between the disfavored CPFF contract and the often risky FFP arrangement. Moreover, the DOD exerted great effort to convert CPFF contracts to one of the more favored forms. The DOD contended that each dollar of procurement switched from a CPFF to an incentive contract saved the Government an average of 10 cents.[19] This position was generally maintained until around 1970, when the CPFF contract regained some favor at the Pentagon. The new view was summed up by one DOD authority who said, "We probably oversold the drive against the indiscriminate use of cost-plus-fixed-fee contracts. Now we are looking for optimistic realism in choice of contract type."[20]

Looking back on the "Golden Era" of incentive contracting in the DOD, four conclusions seem appropriate:[21]

1. There was confusion about the definition of an incentive contract.
2. There was confusion about the objectives in switching from CPFF to incentive contracts.
3. Complex, unwieldy, and often counterproductive incentive arrangements were produced.
4. The impacts of the incentive fees on contractor motivations are uncertain.

Let us discuss each point in turn.

The semantics of "incentive contracting" are confused. First, the contract types we have been talking about so far—FFP, CPFF, and so forth—refer to cost incentives, i.e., arrangements permitting the contractor to share any savings over some target price or cost. In addition to cost incentives, many defense contracts have contained other types of contingent fee arrangements; in particular, schedule and performance incentives are common. In a schedule incentive, the contractor's fee is a function of the dates of delivery of products or completion of tasks. In performance incentives the fee is linked to the value of one or more product characteristics, e.g., accuracy, mean-time-between-failures, speed, and so forth.[22] A multiple incentive contract is one that contains more than one type of incentive. As will shortly be discussed, with multiple incentive fees the ensuing contractor motivations become complex.

To return to the semantic problem, definitional problems arise even if we limit ourselves to cost incentives. Clearly, if we are trying to motivate contractors to be efficient then the FFP contract is an incentive contract, and many authorities so classify it. Logic is on the side of this usage, but in common parlance, the term "incentive contract" is frequently limited to cases where there is some *partial* sharing of the differences between target cost or target price and actual cost. This usage limits incentive contracts to CPIF, FPI, and closely related types.[23]

The definitional problem becomes even more confused if one goes back to basics and starts with the proposition that an incentive contract is one in which the Government attempts to influence contractor motivations by creating a set of fee-contingencies. If one looks at a number of the early incentive contracts let during

the first part of the DOD drive against CPFF contracting, it is doubtful that any important motivations were established. After the constraints, contingency clauses, floors, and ceilings are evaluated, it is hard to see how the contractor's fee could have been affected by any likely contract outcome. Put differently, many defense contracts classified as CPIF or FPI types turned out to be thinly disguised CPFF arrangements.

But let us abandon semantics and turn to more substantive issues such as the objectives of incentive contracts, which were always somewhat unclear.

Recall that Secretary McNamara cited two reasons for switching from CPFF. The first was to increase *contractor* motivations for efficiency and austerity. The second was to increase *Governmental* motivations for clear product specification. The overwhelming part of the discussion of incentive contracts has centered on the first objective. The second has received much less attention even though it may be the chief advantage.

If contractor motivation is the goal, a question arises. If an FPI contract with an 80/20 sharing ratio (the Government bears 80 percent of the cost overruns and receives 80 percent of the underruns) provides motivation for efficiency, would not an FFP contract with a 0/100 sharing ratio provide much more motivation and therefore always be a superior arrangement?

The usual answer cites the risk involved in advanced technology projects. This line of argument holds that FFP is the preferred way to create the desired contractor motivations in low-risk projects. For very-high-risk projects CPFF contracting is probably unavoidable. For projects in between, FPI and CPIF contracts permit increased motivation with the Government still accepting some of the risk, as in a CPFF contract. Unless the Government accepts this risk, the argument goes, the contractor will insist on large risk premiums and cost-contingency allowances.

The extent to which this theory seems to be borne out in practice will be discussed shortly, but for the moment, let us concentrate on the second and more neglected advantage cited for incentive contracts, i.e., that they force intragovernmental thinking about output definition.

In a private conversation, an Air Force official was asked whether incentive contracts really affected contractor motivations. He replied, "I don't care whether contractors are motivated by the incentive fees. What is important to me is that with an incentive contract the Air Force has to tell me *precisely what it intends to buy.* Also, with a CPFF contract, anyone in a blue uniform can walk into a contractor's plant and order changes. With an incentive contract, the contractor demands written authorization and this gives me more control over expenditures."

On the other hand, these benefits of incentive contracting may be liabilities in some programs. Assume the contracting agency wishes to have a great deal of flexibility in changing the program—for example, that it wants to make sequential decisions as more information is generated, and it generally wants to have an interactive relationship between the buyer and the contractor's organization at the working level. Under those circumstances, the need to obtain contract-change authority from a high echelon and to maintain constant program visibility is a costly

burden. CPFF contracts (or some other form of resource contract) would be much more appropriate.

The commentary on product-definition above argued that sophisticated contracting techniques, such as incentive-fee contracts, depend on clear definitions of products. This point was aptly made recently by a DOD authority reflecting on the history of defense contracting:

> For several years, we have cautioned that contractual incentives alone cannot be relied upon to increase contractor efficiency. Other interrelated management techniques and disciplines must also be stressed.
>
> Many years ago we learned that a good initial cost estimate, by itself, was not the only key to good incentives contracting. Often the key to good incentives is the preciseness of the statement of work or objectives. Our experiences have shown that it not only takes a good cost estimate, without over-optimism, to assure that an incentive can be effective, but that the cost estimate must be based on a good statement of work.[24]

Extending this line of reasoning slightly, not only are clear statements of work or clear definitions of product a requirement for incentive contracting but conversely, incentive contracting may be an instrument for obtaining better product definitions and statements of work.

The situation is rather the reverse if we focus not on cost incentives but on schedule and performance incentives. Here the use of incentive fee provisions permits the government to be *less* specific in its statement of work.

Instead of calling out a certain required level of some characteristic or product, or instead of listing a specific delivery schedule, the Government can erect a payments formula and permit the contractor to select the level of the product-characteristic or the actual schedule. Why might this looser procedure be preferable? The usual answer is that the Government may know what some product per se is worth to it, but it may not know what cost-premium it would have to pay to achieve some rigid performance requirement or delivery time. The flexibility of incentive fees enables the contractor to give the Government more capability or faster delivery if it is justified from a cost standpoint.

This line of argument is valid as a general statement, but three cautionary points are needed. First, the purpose of incentive fees is perverted if specifying a performance incentive function becomes a substitute for hard and precise thinking about what the product characteristic or schedule requirements are for a product. Second, this approach to performance and schedules often generates complexity, lack of program visibility, and perverse incentives. Third, the use of performance and schedule incentives hinges on the assumption that the value of higher performance or earlier deliveries can be satisfactorily estimated. If this assumption fails to hold, performance and schedule incentives are shots in the dark and such shots often hit unintended targets.

The possible complexity of contractor motivations generated by incentive contracts has been cited at several points. When incentive arrangements become com-

plex—for example, when they have "floors," "ceilings," "elbows," and especially multiple incentives—the contractor enjoys an array of potential tradeoffs. These can be very important to him in an uncertain world. For example, he may find it profitable to save money by stretching out the project, incurring a penalty under the schedule incentive but earning a higher bonus under the cost incentive. Or, he may exceed the ceiling on the cost incentive in order to remain in the effective range of the performance incentive. The Government is often unaware that these possibilities exist, and assumes that the contractor will attempt to excel in all incentivized areas.

Another aspect of this problem is that the Government can lose the ability to understand what is happening with complex or multiple incentives. The contractor may state, correctly, that since he has an incentive contract (that is, for results) his resource and effort allocations must be his responsibility. The Government may not be able to figure out from external evidence how these allocations are being affected by the various incentives, and whether the actual motivations are the desired motivations.

The moral is that any incentive contract should be carefully analyzed and "gamed" to make sure that the contracting agency understands fully and precisely the entrepreneurial incentives it is creating. This is not an easy task with most incentive contracts. The Air Force found it necessary to establish an office with extensive computer capacity, several well-trained analysts, and sophisticated software, and give it responsibility for analyzing incentive fee provisions. Contracting officers can send their contracts to this office and receive rather complex graphs and statistics about the inherent incentives and potential tradeoffs. Without such a sophisticated capability the appropriate rule would appear to be, "Keep incentive-fee arrangements simple."

Turning to the fourth generalization, that the impact of incentive contracting on Government procurement is uncertain, we should note that this is a controversial issue. Secretary McNamara firmly believed in the efficacy of incentive contracts and took credit for a 10-percent price reduction whenever he shifted a contract from a CPFF arrangement to some other type. More recent Pentagon spokesmen discount this figure but still generally agree that incentive contracts have had favorable impacts.

Economists analyzing these impacts have had difficulty in identifying them. The seminal investigation by Scherer, for example, concludes that the effects of contract incentives, even multiple incentives involving cost, performance, and schedule, were swamped by noncontract incentives. The chief of these was the desire for follow-on contracts. Scherer found that contractors were so bent on obtaining lucrative follow-on production contracts that other possible rewards paled into insignificance.[25]

Other investigations have reached similar conclusions. To illustrate, an econometric study of a sample of Air Force procurements concluded that:

> ... the incentive effect on contractors' costs and efficiency may be weaker than is customarily believed. Rather, the evidence suggests that

the cost underruns commonly observed for Air Force incentive contracts are the result of a general upward shift in target costs rather than improved cost control.

The investigator went on to argue, however, that:

> Incentive contracts have several important advantages that should not be overlooked. Because of the upward shift in target costs, incentive contracts provide the Government with better program cost information than do cost-reimbursable contracts. Because target costs are more realistic for incentive contracts, they permit better financial planning and budgetary control while eliminating the large overruns characteristic of cost-reimbursable contracts. Moreover, incentive contracts may have made both the Government and defense contractors a little more cost-conscious than before.... Consequently, these contracts may have resulted in cost savings. Unfortunately, these salutary effects cannot be measured and quantified.[26]

In short, the question of whether incentive contracts have decreased the cost or improved the quality of defense procurement would have to be answered with a verdict of "not proven." Our personal judgment, however, is that the use of incentive (results) contracts has had net positive impacts in comparison with CPFF (resource) contracting, most importantly because it has stimulated defense procurement officials to be more precise in the manner in which they purchase goods and services.

NASA Procurement

Most of the above commentary on DOD experience and practice also applies to NASA, whose system acquisition and procurement procedures are closely similar. One NASA practice merits attention here, however: the use of Cost-Plus-Award-Fee (CPAF) contracting. CPAF contracts have been used by both NASA and the DOD since 1962, but are more of a NASA specialty.

With fixed-price contracts, the Government is concerned mainly with the product it is procuring. With cost-reimbursement contracts, the Government's main concern is with contract costs. The common incentive contracts (CPIF and FPIF) are concerned with both costs and results and, in addition, supposedly provide incentives for the contractor to produce efficiently; but since the incentives are assumed to operate automatically, the Government is seldom able to evaluate their effectiveness. The unique feature of a CPAF contract is that the fee is based on the Government's explicit (if subjective) evaluation of the contractor's internal operations. The award fee is supposed to be "... sufficient to provide motivation for excellence in contract performance in areas such as quality, timeliness, ingenuity and cost effectiveness."[27] The early applications of this technique were for support services such as "housekeeping" facilities; but the 1969 *Incentive Contracting Guide for DOD/NASA* suggests that CPAF contracts may be appropriate for development projects

in which CPIF contracts cannot be used because output cannot be objectively and quantitatively measured.[28]

Six elements must be specified in a CPAF contract:

1. Target cost estimate
2. A fixed base fee (may be zero) that does not vary with performance
3. An award fee based on a subjective evaluation of "performance"
4. The maximum total permitted for (2) plus (3)
5. Performance evaluation criteria
6. Schedule of fee payment dates

An evaluation plan and judgment system must be developed prior to the start of the program, although this does not have to be part of the contract itself.[29] The evaluations are unilateral determinations by the Government. The evaluation group consists of knowledgeable Governmental personnel.[30] Evaluations are furnished the contractor along with a procedure for comment or appeal to an official Evaluation Board or Fee Determination Official.[31] The decision of this board or official is not challengeable under the standard DOD/NASA "Disputes" clause, but it can be pursued through other regularly established channels.[32]

The key issue is evaluation criteria. The DOD/NASA *Guide* states that:

> Criteria for evaluation should represent work "output." The contracting officer and project manager are concerned with results rather than the "input" to a contract. The standards assigned to the outputs and the grading of the outputs are of extreme importance. There are many objective measurements or historical standards available to grade certain outputs and these can form the basis for the over-all subjective evaluation of efficiency. Virtually all desired results are reducible to some standard of acceptability and effectiveness. When a sound description of what constitutes acceptable work or improved levels of work cannot be outlined, there should be no effort to incentivize the performance, and it should be performed under a CPFF contract.[33]

Observe the implied definition of the word "output," which in this context refers to work performed and production processes, and should not be confused with any "product" called for under the contract. The ASPR provides an example of evaluation criteria and a sample form for aggregating the individual criteria. These are reproduced here as Figs. 1 and 2.

The obvious requirement for such a procedure is that meaningful, qualitative criteria can be defined. These criteria must permit the contractor to know how to respond and the evaluation panel to render a judgment, and they must be clear enough that a review authority can resolve any disputes between the Government and the contractor. These are not trivial requirements. Nonetheless, NASA has made extensive use of this procedure and knowledgeable officials seem generally pleased with it.

The experience with CPAF contracting has yielded three generally accepted conclusions.[34] First, it is an expensive procedure that requires substantial time and

PERFORMANCE EVALUATION REPORT CRITERIA

		Submarginal 0–60	Marginal 61–70	Good 71–80	Very Good 81–90	Excellent 91–100
A Time of Delivery	(A–1) Adherence to plan schedule.	Consistently late on 20% of plans.	Late on 10% plans w/o prior agreement.	Occasional plan late w/o justification	Meets plan schedule.	Delivers all plans on schedule & meets prod. change requirements on schedule.
	(A–2) Action on Anticipated delays.	Does not expose changes or resolve them as soon as recognized.	Exposes changes but is dilatory in resolution on plans.	Anticipates changes, advise Shipyard but misses completion of design plans 10%.	Keeps Yard posted on delays, resolves independently on plans.	Anticipates in good time, advises Shipyard, resolves independently and meets production schedule.
	(A–3) Plan Maintenance	Does not complete interrelated systems studies concurrently.	System studies completed but constr. plan changes delayed.	Major work plans coordinated in time to meet production schedules.	Design changes from studies and interrelated plans issued in time to meet product schedules.	Design changes, studies resolved and test data issued ahead of production requirements.
B Quality of Work	(B–1) Work Appearance	25% dwgs. not compatible with Shipyard repro. processes and use.	20% not compatible with Shipyard repro. processes and use.	10% not compatible with Shipyard repro. processes and use.	0% dwgs. prepared by Des. agent not compatible with Shipyard repro. processes and use.	0% dwgs. presented incl. Des. agent, vendors, subcontr. not compatible with Shipyard repro. processes and use.
	(B–2) Thoroughness and Accuracy of Work.	Is brief on plans tending to leave questionable situations for Shipyard to resolve.	Has followed guidance, type and standard dwgs.	Has followed guidance, type & standard dwgs. questioning and resolving doubtful areas.	Work complete with notes and thorough explanations for anticipated questionable areas.	Work of highest caliber incorporating all pertinent data required including related activities.
	(B–3) Engineering Competence	Tendency to follow past practice with no variation to meet reqmts. job in hand.	Adequate engrg. to use & adapt existing designs to suit job on hand for routine work.	Engineered to satisfy specs., guidance plans and material provided.	Displays excellent knowledge of constr. reqmts. considering systems aspect, cost, shop capabilities and procurement problems.	Exceptional knowledge of Naval shipwork & adaptability to work process incorporating knowledge of future planning in Design.

PERFORMANCE EVALUATION REPORT CRITERIA (Cont'd.)

		Submarginal 0–60	Marginal 61–70	Good 71–80	Very Good 81–90	Excellent 91–100
B Quality of Work (Cont'd.)	(B–4) Liaison Effectiveness	Indifferent to requirements of associated activities, related systems, and Shipyard advice.	Satisfactory but dependent on Shipyard to force resolution of problems without constructive recommendations to subcontr. or vendors.	Maintains normal contact with associated activities depending on Shipyard for problems requiring military resolution.	Maintains independent contact with all associated activities, keeping them informed to produce compatible design with little assist. for Yard.	Maintains expert contact, keeping Yard informed, obtaining info from equip., supplies w/o prompting by Shipyard.
	(B–5) Independence and Initiative	Constant surveillance req'd. to keep job from slipping—assign to low priority to satisfy needs.	Requires occasional prodding to stay on schedule & expects Shipyard resolution of most problems.	Normal interest and desire to provide workable plans with average assistance & direction by Shipyard.	Complete & accurate job, free of incompatibilities with little or no direction by Shipyard.	Develops complete and accurate plans, seeks out problem areas and resolves with assoc. act. ahead of schedule.
C Effectiveness in Controlling and/or Reducing Costs	(C–1) Utilization of Personnel	Planning of work left to designers on drafting boards.	Supervision sets & reviews goals for designers.	System planning by supervisory, personnel, studies checked by engineers.	Design parameters established by system engineers & held in design plans.	Mods. to design plans limited to less than 5% as result lack engrg. system correlation.
	(C–2) Control Direct Charges (Except Labor)	Expenditures not controlled for services.	Expenditures reviewed occasionally by supervision.	Direct charges set & accounted for on each work package.	Provides services as part of normal design function w/o extra charges.	No cost overruns on original estimates absorbs service demands by Shipyard.
	(C–3) Performance to Cost Estimate	Does not meet cost estimate for original work or changes 30% time.	Does not meet cost estimate for original work or changes 20% time.	Exceeds original est. on change orders 10% time and meets original design costs.	Exceeds original est. on change orders 5% time.	Never exceeds estimates of original package or change orders.

Fig. 1—CPAF "output" criteria

Ratings	
Excellent	(91–100)
Very good	(81– 90)
Good	(71– 80)
Marginal	(61– 70)
Submarginal	(0– 60)

Period of _____ 19____
Contract Number _____
Contractor _____
Date of Report _____
PNS Technical Monitor/s _____

CATEGORY	CRITERIA	RATING	ITEM FACTOR	EVALUATION RATING	CATEGORY FACTOR	EFFICIENCY RATING
A	TIME OF DELIVERY					
	A-1 Adherence to Plan Schedule	_____	x .40 =	_____		
	A-2 Action on Anticipated Delays	_____	x .30 =	_____		
	A-3 Plan Maintenance	_____	x .30 =	_____		
		Total Item Weighed Rating		_____	x .30 =	_____
B	QUALITY OF WORK					
	B-1 Work Appearance	_____	x .15 =	_____		
	B-2 Thoroughness and Accuracy of Work	_____	x .30 =	_____		
	B-3 Engineering Competence	_____	x .20 =	_____		
	B-4 Liaison Effectiveness	_____	x .15 =	_____		
	B-5 Independence and Initiative	_____	x .20 =	_____		
		Total Item Weighed Rating		_____	x .40 =	_____
C	EFFECTIVENESS IN CONTROLLING AND/OR REDUCING COSTS					
	C-1 Utilization of Personnel	_____	x .30 =	_____		
	C-2 Control of all Direct Charges other than labor	_____	x .30 =	_____		
	C-3 Performance to Cost Estimate	_____	x .40 =	_____		
		Total Item Weighed Rating		_____	x .30 =	_____

TOTAL WEIGHED RATING _____
Rated by: _____
Signature(s) _____

NOTE: Provide supporting data and/or justification for below average or outstanding item ratings.

Fig. 2—ASPR Contractor Performance Evaluation Report

74

administrative effort. This conclusion appears to underlie the Armed Services Procurement Regulation prohibition on the use of CPAF contracts "... where the contract amount, period of performance or the benefits expected are insufficient to warrant the additional administrative effort or cost."[35]

Second, it is difficult to demonstrate that contractors have been positively motivated by CPAF contracts. In this respect NASA experience appears comparable to DOD incentive contracting experience.

Third, and most important, NASA officials believe that CPAF contracts greatly improve communication between NASA and its contractors. With this procedure, NASA has access at regular intervals (often quarterly) to evaluate the internal operations of the contractor, who then receives a summary of NASA's conclusions. This causes problems to surface earlier in a program than they would be likely to with some other type of contract, and it lets the contractor know at regular intervals how he stands with his customer.

The Clearfield Job Corps Training Program

Most of the Federal Government's programs for manpower development, training, or education have not utilized incentive fees. They have generally used CPFF or CR pricing arrangements. The dominance of this conventional approach makes the contract between the Manpower Administration of the U.S. Department of Labor (Job Corps) and the Thiokol Chemical Corporation all the more interesting. This contract,[36] covering the operation of the Freeport Center at Clearfield, Utah and related facilities, provides for a fee with a performance incentive.

In addition to center management, group-life training, and the other aspects of Job Corps projects, Thiokol is responsible for vocational and related academic training and counseling in 8 areas: agriculture, automotive, food services, medical, metals, plastics, miscellaneous (carpentry, photography, etc.), and advanced paraprofessional training for Corpsmen. The 1970 contract (Supplemental Agreement 10) as amended on July 24, 1970, essentially segregates the program costs into two parts. The first is a CPFF portion. The costs of this part of the contract amount to $3.2 million and provide for a fee of $127 thousand. The CPIF portion involves Target Estimated Costs of $11 million. The incentive fee could vary from a minimum of $324 thousand (1.8 percent of cost) to $952 thousand (7.5 percent of cost). The Target Profit is $644 thousand (4.7 percent of cost).

The incentive fee provisions set out four measures of Thiokol achievement. There is no need to repeat the details of the achievement objectives, but a brief description of each objective and its impact on the fee may be useful.

The GED or high school diploma incentive is straightforward. Thiokol is to receive $29.00 for each Corpsman finishing high school while at Clearfield. Definitions and verification procedures are also straightforward.

The placement incentive is also straightforward. Thiokol is to receive $21.65 per Corpsman placed on a job, in a conventional school, or the military service. Placement is defined by reference to the Job Corps Placement Manual. Verification, however, requires some complex reporting requirements.

The incentive for completion of defined courses is detailed in the context of Thiokol's curriculum design. Two types of courses are involved: basic education and

1. The basic education requirements for earning the program completion incentive is satisfied by completion of Level Nine (9) Sullivan Series, or Job Corps Reading Level Sixteen (16) for Corpsmen in full time vocational training.
2. Completion of a defined course is satisfied by a Corpsman completing all step-off levels within one specific program under a training cluster. A typical example would be the completion of the Meatcutting program under the Food Services Training Cluster.

The retention incentive essentially provides $7.67 for each Corpsman for each month in residence, starting 90 days after enrollment and with a nine months' maximum. Mechanized attendance reports are used for verification.

So far as we can determine, there has been no analytic comparison of the performance incentive approach of the Clearfield project with the conventional approach. Department of Labor officials appear pleased with the Clearfield program, however, and expect to continue the basic incentive approach.

NOTES

Section I
Introduction

1. Distant educational antecedents can also be found. For example, in 1862 Robert Lowe, Vice-President of the British Committee of the Privy Council for Education, sponsored a plan called "Payment by Results." Funds would have been allocated according to student grades in basic skills. The reaction to Lowe's plan led to his resignation two years later. J. Pfeiffer, *A New Look at Education*, The Odyssey Press, New York, 1968, p. 80.

2. *Reading Crisis: The Problem and Suggested Solutions*, An *Education U.S.A.* Special Report, National School Public Relations Association, Washington, D.C., 1970, p. 1.

3. Robert C. Burkhart, *The Assessment Revolution*, Buffalo State University, Buffalo, N.Y., 1970, p. 5.

4. Speech to the National Association of State Boards of Education, September 23, 1969.

5. C. H. Harrison, "Who is Accountable?," *Scholastic Teacher: Supplement*, November 1970, p. 6.

6. For a general review of the discussion about accountability, see S. M. Barro, *An Approach to Developing Accountability Measures for the Public Schools*, The Rand Corporation, P-4464, September 1970.

7. L. M. Lessinger, *Every Kid a Winner: Accountability in Education*, Simon and Schuster, New York, 1970.

Section III
Contracting for Student Achievement: General Considerations

1. Peat, Marwick, Mitchell & Co., *Planning, Programming, Budgeting System Manual for State of California School Districts*, prepared for the Advisory Commission on School District Budgeting and Accounting, June 1970, p. II-7.

2. N. F. Kristy, "The Future of Educational Technology," *Phi Delta Kappan,* Vol. 48, January 1967, p. 240.

3. "Hucksters in the Schools: The Performance-Contract Phenomenon," *American Teacher,* September 1970, p. 11.

4. A classic case on this point is *Page v. Academy,* 63 N.H. 216 (1884). In 1879, Haverhill, New Hampshire entered into a three-year contract with Haverhill Academy, a corporation. The Academy was to instruct the town's students and the school district was to turn over to the Academy all funds furnished to it by the town for education. In what would probably be called a class-action suit today, Page, a school committee member, contended that the contract constituted an illegal surrender of authority by the committee and that it prevented him from properly discharging his duties. The court upheld the contract, partly on the grounds that it did not vest the Academy with authority over the school committee, nor did it merge the Academy with the school district.

5. The concern over public control is perhaps related to concern about another issue, monopoly. (One of the AFT charges, for example, is that performance contracting "threatens to establish a monopoly of education by big business." Ibid.) The fear is probably illusory. The economic structure of the market for educational services appears very unfavorable for monopoly. On the buyer's side there are around 26,000 school districts. On the selling side there are now probably 100 groups that offer performance contracting services or that have demonstrated interest in and capability of entering this market. Entry is easy; few structural barriers exist and many new firms have been formed or have moved into this market from other areas. Most important, there appears to be no evidence that size provides any major economic advantage. The smaller firms appear to be doing as well as or better than the larger firms. Since it is difficult to perceive any economies of scale, it is likely that this condition will continue.

6. Already, in fact, a local teachers' organization in Mesa, Arizona, has entered into a performance contract with at least the partial aim of keeping other contractors out. See J. K. Zaharis and F. W. English, "Performance Contracting: Hobson's Choice for Teachers?," paper presented at the California Teachers Association's Good Teaching Conference, Los Angeles, Calif., January 29, 1971.

7. This subject is perceptively discussed in a forthcoming report for the New York Board of Regents: "Performance Contracting in Education," prepared by the Division of Evaluation, the State Education Department, University of the State of New York, Albany, 1970.

Section IV
Contracting for Student Achievement: Current Programs

1. The precise payoff function for each subject was $P = \$80 \times HA/80$ hr, where P = payment per student, A = grade-level advance, and H = hours of instruction. Several constraints were written into the contract: (1) the maximum

payment per student per subject was $106.67; (2) if more than 110 hours were required for a grade-level advance, the payment would decrease by $1 for each additional hour. This implies that $P = 0$ if $H \geq 168$ for $A = 1$.

2. It is only fair to note that there are occasional claims that some teachers teach to the test even without performance contracts. See, for example, "Board to Probe UTLA Evidence on Reading Tests," *Los Angeles Times,* November 3, 1970, Part II, p. 1.

3. R. T. Lennon, "Accountability and Performance Contracting," paper presented to the American Educational Research Association, New York, N. Y., February 5, 1971. For further discussion of technical testing problems see S. P. Klein, "The Uses and Limitations of Standardized Tests in Meeting the Demands for Accountability," *U.C.L.A. Evaluation Comment,* Vol. 2, No. 4, January 1971. A seminal work on measurement error is L. J. Cronback and L. Furby, "How Should We Measure 'Change'—Or Should We?," *Psychological Bulletin,* Vol. 74, No. 1, July 1970, pp. 68-80. Criterion-referenced testing is also reviewed in J. Millman, "Reporting Student Progress: A Case for a Criterion-Referenced Marking System," *Phi Delta Kappan,* Vol. 52, No. 4, December 1970, pp. 226-230.

4. Several groups, e.g., Education Turnkey Systems, Inc., The Institute for Educational Development, and the Research Council for the Great City Schools, have compiled extensive information concerning private firms in the educational market. The best reference is in Efrem Sigel, *Accountability and the Controversial Role of the Performance Contractors,* Knowledge Industry Publications, Inc., 1971.

5. See Education Turnkey Systems, Inc., *Performance Contracting in Education,* Research Press, Champaign, Ill., 1970.

6. Vol. 1, April 1970, p. 4.

7. For an example of this view, see L. M. Lessinger, "Engineering Accountability for Results in Public Education," *Phi Delta Kappan,* December 1970.

8. Ibid., pp. 220-221.

Appendix
Some Contracting Experiences in Other Sectors

1. T. L. Lincoln, M.D., a Rand colleague, suggests that the basic definitional problem is the same in both education and medicine. Both are process operations. A clear starting point and end point can seldom be defined. Instead, individual educational and medical treatments, in Lincoln's view, usually are one of a series of related treatments made throughout an individual's life, and it is difficult to evaluate any single treatment in isolation.

2. R. G. Evans, "Efficiency Incentives in Hospital Reimbursement," unpublished Ph.D. dissertation, Harvard University, 1970, p. 4.

3. See ibid. for a theoretical analysis and a discussion of the implications of the empirical evidence.

4. C. L. Schultze, "The Role of Incentives, Penalties, and Rewards in Attain-

ing Effective Policy," U.S. Congress, Joint Economic Committee, Subcommittee on Economy in Government, *The Analysis and Evaluation of Public Expenditures: The PBS System,* Vol. I, 91st Cong., 1st sess., U.S. Government Printing Office, Washington, D.C., 1969, p. 213.

5. J. P. Newhouse, "Toward a Theory of Nonprofit Institutions: An Economic Model of a Hospital," *American Economic Review,* Vol. 60, No. 1, March 1970, pp. 64-74; originally published by The Rand Corporation, P-4022, January 1969.

6. Op. cit., p. 214.

7. For a clear analysis of this problem and some interesting examples of payment schemes with perverse incentives, see M. L. Ingbar's review of Edward M. Kaitz, *Pricing Policy and Cost Behavior in the Hospital Industry,* Frederick A. Praeger, New York, 1968. The review appears in *Journal of Economic Literature,* Vol. 8, No. 3, September 1970, pp. 880-882.

8. *Report of the National Advisory Commission on Health Manpower,* U.S. Government Printing Office, November 1967, Vol. 1, pp. 46-48.

9. "Local Panels to Review Doctors' Work and Bills are Urged by Critics," *Wall Street Journal,* December 16, 1970, p. 1.

10. J. P. Newhouse and V. D. Taylor, *A New Approach to Hospital Insurance,* The Rand Corporation, P-4016, January 1969.

11. For a discussion of the economic characteristics of health, see H. E. Klarman, *The Economics of Health,* Columbia University Press, New York, 1965, pp. 10-20.

12. Those interested in exploring the issue of government procurement of goods and services at greater length might begin with the series of hearings by the Holifield Committee on establishing a commission on government procurement: U.S. Congress, House of Representatives, Committee on Government Operations, Military Operations Subcommittee, *Government Procurement and Contracting,* 91st Cong., 1st sess., U.S. Government Printing Office, Washington, D.C., 1969. Other well-known studies are: H. Orlans, *Contracting for Atoms,* The Brookings Institution, Washington, D.C., 1967; C. H. Danhof, *Government Contracting and Technological Change,* The Brookings Institution, Washington, D.C., 1968; D. C. Reck, *Government Purchasing and Competition,* University of California Press, Berkeley and Los Angeles, 1954.

13. Work on output measures for water resources antedate the defense efforts and is an intellectual ancestor of attempts to define Governmental outputs.

14. FFP contracts are allowed to contain escalation clauses pertaining to the price of major inputs, but such clauses are seldom used.

15. A DOD/NASA contracting guide quotes, from the *ASPR Manual for Contract Pricing* (ASPM No. 1), "three characteristics which distinguish CPIF from FPIF and FPIS contracts. . . . One is the absence of a ceiling price. Second, in the CPIF situation, costs are reimbursed in accordance with ASPR Section XV and terms of the contract, while in FPI contracting, final cost is established in accordance with a negotiated agreement. Third, under a CPIF contract, the maximum fee the contractor can receive is subject to ASPR limitations. Maximum fees in excess of the ASPR limits require approval as deviations." Department of Defense, Na-

tional Aeronautics and Space Administration, *Incentive Contracting Guide, October 1969,* U.S. Government Printing Office, Washington, D.C., 1969, p. 33 (hereafter cited as DOD/NASA *Guide*).

Thus it appears that CPIF contracts are considered to be "cost-type" contracts simply because they utilize the ASPR regulations on allowable and allocable costs and *not* because they are resource contracts, which they are not.

16. The degree to which an FPR contract really has a fixed price is debatable, but it is conventionally classified as a fixed-price contract as we have done here.

17. U.S. Congress, Joint Economic Committee, Subcommittee on Defense Procurement, *Impact of Military Supply and Service Activities on the Economy,* Hearings, March 28, 29, and April 1, 1963, Government Printing Office, Washington, D.C., 1963, p. 28.

18. Ibid.

19. I. N. Fisher, *A Reappraisal of Incentive Contracting Experience,* The Rand Corporation, RM-5700-PR, July 1968, p. 3.

20. R. D. Lyons, "Experiences with Incentives—Changes Needed," *Defense Industry Bulletin,* Vol. 6, No. 1, January 1970, p. 23.

21. In this review, extensive use has been made of ibid.; G. R. Hall and R. E. Johnson, *A Review of Air Force Procurement, 1962-1964,* The Rand Corporation, RM-4500-PR, May 1965; G. R. Hall and R. E. Johnson, *Aircraft Co-Production and Procurement Strategy,* The Rand Corporation, R-450, May 1967; and I. N. Fisher, op. cit. See also F. M. Scherer, *The Weapons Acquisition Process: Economic Incentives,* Harvard University Press, Boston, Massachusetts, 1963.

22. Performance incentives are not a new invention. The Wright Brothers' first airplane contract with the U.S. Army had such a fee arrangement.

23. Such as the cost-plus-award-fee (CPAF) contract to be discussed later.

24. Lyons, op. cit., p. 23.

25. Scherer, op. cit., pp. 166-167.

26. Fisher, op. cit., p. 47.

27. ASPR 3-405.5 (a).

28. DOD/NASA *Guide,* p. 243.

29. Ibid., p. 244.

30. Thus the CPAF procedure differs from the I/D/E/A procedure; in the latter case the contractor is represented on the judgment panel.

31. ASPR 3-405.5.

32. DOD/NASA *Guide,* p. 245.

33. Ibid., p. 246.

34. Professor Ralph C. Nash, Jr., provided the following summary.

35. ASPR 3-405.5(g)(ii).

36. Actually a series of supplemental agreements and modifications to the basic contract for 1969, No. B99-4707, signed February 28, 1969 and effective February 5, 1969.